St. Petersburg University
Graduate School of Management
Master in Management Program

INFLUENCE OF KNOWLEDGE MANAGEMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE: EMPIRICAL RESEARCH AT RUSSIAN SME'S

Master's Thesis by the 2nd year student
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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АННОТАЦИЯ

Автор	Юлия Колотова
Название ВКР	Влияние процессов управления знаниями на результаты деятельности компании: эмпирическое исследование в малом и среднем бизнесе в России
Образовательная программа	Менеджмент (Master in Management)
Направление подготовки	Менеджмент
Год	2018
Научный руководитель	Дмитрий Вячеславович Кудрявцев
Описание цели, задач и основных результатов	Целью данной работы являлось выявление влияния практик и процессов управления знаниями (УЗ) на результаты деятельности российских компаний в малом с среднем бизнесе. Чтобы достичь поставленной цели, было проделано несколько шагов. Вначале, обзор литературы позволил выявить необходимые гипотезы и методы исследования. Для сбора данных был использован опросник, составленный по фреймворку Gold et al. (2001). Данный опросник включает в себя следующие разделы: способность компании приобретать знания, конвертировать знания, применять знания и защищать знания, а также наличие в компании организационной структуры, культуры и технологий, которые способствуют УЗ. Результаты опроса были проанализированы с точки зрения выявления текущего уровня способностей к УЗ в компаниях малого и среднего бизнеса в России. Анализ показал, что в среднем по компаниям уровень выше среднего, а это значит, что есть потенциал для внедрения комплексного подхода к УЗ. Также, был проведен регрессионный анализ и выявлена позитивная корреляция между процессами и практиками УЗ и результатами деятельности компаний. В целом, анализ показал похожие выводы с подобными исследованиями, проведенными за рубежом.
Ключевые слова	Управление знаниями, результаты деятельности компании, знаниевые процессы, малый и средний бизнес, Россия

ABSTRACT

Master Student's Name	Iuliia Kolotova
Master Thesis Title	Influence of knowledge management practices on organizational performance: empirical research at Russian SME's
Educational Program	Graduate School of Management, Master in Management
Main field of study	Management, general track
Year	2018
Academic Advisor's Name	Professor Dmitry V. Kudryavtsev
Description of the goal, tasks and main results	The goal of this work is to identify how do knowledge management (KM) practices and processes influence on organizational performance of SMEs in Russia. To reach this goal numerous steps were taken and performed. First, critical literature review allowed to draw hypotheses and research methodology. Gold et al. (2001) framework was used to gather the evidence of Russian SMEs applying in their work following KM practices and processes: knowledge acquisition, knowledge conversion, knowledge application and knowledge protection practice capabilities, organizational structure, organizational culture and technology capabilities. The outcomes of a questionnaire were used in two ways: first, to see which processes and practices are more developed in Russian SMEs; and second, to run a regression analysis to find a correlation between different types of KM capabilities and organizational performance. The analysis of current KM practices at Russian SMEs showed that on average all of them are at the level above medium almost all the companies-respondents use several KM tools in their business routine, which means that the companies have potential to embed complex KM system to their business processes. The regression analysis identified that Organizational structure capabilities is the only knowledge process capability which impact does not have significance to organizational performance. The general KM indicator and other KM capabilities showed to have positive correlation with organizational performance, which corresponds to similar studies conducted abroad.
Keywords	Knowledge Management, Russian SMEs, Organizational Performance, Knowledge Process capabilities, Knowledge Infrastructure capabilities

Agenda

Introduction

Modern globalized world with open access to the information, new technologies and severe competition in the market requires companies to think of new ways to stay competitive and survive. One of the sources for innovativeness and competitive advantage is Knowledge Management (KM), which provides companies with tools, practices and processes to better accumulate, generate, transfer, apply, and store knowledge (Desouza, 1998). All of this improve companies' business processes and allow them to learn better and react faster (Omotayo, 2015).

Since SMEs started to be recognized as drivers of economies, foreign researches pay more attention to them and lead thorough investigation of KM in the context of SMEs. Works on this topic usually starts with a broad concept of KM and organizational performance, which then leads to more narrow fields of investigation of KM tools and practices and their influence on the companies. As in Russia currently only large corporations are aware of KM and implementing it in their work, academics also concentrate on them as their research subjects.

Meanwhile, the closing rate of SMEs in Russia is still high despite governmental efforts to protect those companies. KM could be their way to increase efficiency. Therefore, **research problem** of present work is following: increase the understanding of KM in the context of SMEs in Russia and confirm a link between KM practices and organizational performance in SMEs in Russia.

Research questions:

Which types of KM processes and practices are more developed in Russia among SMEs?

How do KM practices correlate with organizational performance in Russia?

Which KM practices correlate in which way with organizational performance in SMEs in Russia?

The results of this work could serve to managers as a ground for future thoughts of introducing broader KM practices and processes in SMEs in Russia to increase their competitiveness and financial performance.

The structure of this research paper is as follows: the review of literature with deducted research problem and research questions is presented in Chapter I, followed by research design and choice of research methods in Chapter II. Chapter III is entirely empirical and includes description of the work done and discussion of the results. The work is completed with the conclusion.

CHAPTER I. Literature Review

This literature review is designed to introduce important for this research terms and definitions. We start with the definition of knowledge itself since it is the main subject of KM, its type and knowledge lifecycle. We continue with the role of KM in organizations, focusing of SMEs and current state of KM in Russian SMEs. The literature review finishes with brief discussion of parameters of organizational performance and identifying of research gap and problem as well as practical relevancy of given research.

1.1. Knowledge

1.1.1 Organizational Knowledge

When Oxford dictionary defined knowledge as "facts, information, and skills acquired by a person through experience or education; the theoretical or practical understanding of a subject", it would be wrong to apply the same definition when talking about knowledge in an organization. First of all, it is highly important to distinct data, information and knowledge when talking about KM. Without getting clear boundaries between those three terms it is impossible to understand why knowledge management exists.

Following the work of Holseapple (2004) data is the set of discrete objective facts about the event (symbols), information is the data arranged in a special (purposeful) way. Knowledge considers human values and beliefs (Davenport and Prusak, 1998) and appears when the information is processed, answers the question "how?" and has meaning given the task it was processed for. Knowledge is what makes it possible to act based on information given and make it valuable (Sveiby 1997). In other words, in an organization knowledge appears when the processed information is applied in a daily routine of organization and from that action the new knowledge is generated in order to help understand and process the information again. (Nonaka & Takeuchi, 1995). Or, as it is stated by Davenport and Völpel (2001) knowledge in an organization is "codified information with a high proportion of human value-added, including insight, interpretation, context, experience, wisdom, and so forth."

In that sense data, information and knowledge have interdependent relationship, when data and information help to create new knowledge and knowledge is used to arrange data and process information in order to get new insights (Bell, 1999). The organization must definitely manage all three in their business processes since they lose their value without one another.

To be fair there are more than one definition of organizational knowledge (Evans, Easterby-Smith, 2001). Shortly, one camp of researches emphasizes the fact, that knowledge has the form of daily routines, meaning that rules, procedures, norms, beliefs and frameworks are embedded into them. All of those are the result of accumulated experience and define company's future behavior (Levitt & March, 1996). The other view on knowledge points out at the functional side of a knowledge, which is company's competitive advantage (Spender, 1996) and a sort of organizational capability (Nanda, 1996). As for our research both of those points of view are valuable, and they are not mutually exclusive. When the first definition tells about the nature and forms of knowledge, the second one tells about the importance of knowledge management, and, therefore, about the importance of this research.

1.1.2. Knowledge Characteristics

Knowledge takes different forms and has different characteristics, therefore require specific tools and instruments for management. Furthermore, there are several types of organizational knowledge that a manager should take into account.

Tacit & Explicit dimensions of Knowledge

As the organization starts with the idea created by one person, organizational knowledge is accumulated by combining knowledge of many individuals (Nonaka, 1991). Tacit knowledge is of this kind - it is presented as personal experience, skills, everything that can be found in person's head and, in our case, useful for the company. It can be embedded into the organization as everyday procedures, cultural rituals, traditions and values (Baloh, Desouza, 2011). Consequently, this knowledge is shown in action and is hard to articulate. Main methods of distinguishing and sharing it is through observation and communication.

Explicit knowledge is formal and structured. It can be codified on the paper, transferred to others through IT systems, stored and learned (Nonaka, 1994). As it stays with the organization even when the owner of the information is gone, it can be named truly organizational. Thus, organization should try to find ways to transform tacit knowledge into explicit so that it stays as part of organizational intellectual capital (Omotayo, 2015). It is, naturally, one of the goals of KM. Although it is impossible to manage personal knowledge inside people's heads, KM has the tools to coordinate individual's knowledge into bringing value for the organization (Maasdorp, 2001).

Knowledge Lifecycle: creation, codification, transfer

As tacit knowledge also has collective element that is paradigm of the world, or a number of presuppositions people are used to live in or subconsciously act upon. Concerning firms, it is kind

of organizational culture, the order of things that every employee embraces as given. Explicit and codified knowledge has more potential to become collective, stay within the organization and bring value to the company. That is why the KM function that almost every researcher is agree upon is management of knowledge lifecycle: creation, transfer, codification

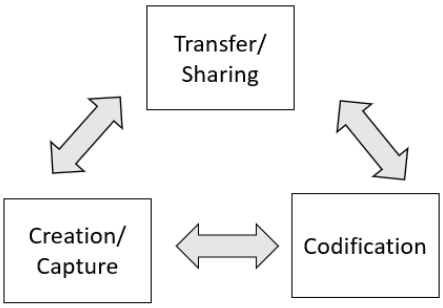


Fig. 1. Knowledge Lifecycle

Knowledge-intensive and innovative companies have knowledge creation as their core function. Mostly creation refers to R&D departments of the companies, but knowledge can be created anywhere on the workplace and can touch any step of the operation process. According to Nonaka (2000) article knowledge only appears when context (timing) and place makes sense, otherwise it is just an information or a baseless idea. In most senses it relates to the idea that an organizational culture nurturing knowledge creation and motivating knowledge sharing should exist in a company.

Nonaka and Takeuchi (1995) created a comprehensive model of knowledge creation cycle which consists of four main processes when knowledge go from tacit to tacit (through shared experience) - *socialization*, from tacit to explicit (articulating, making it shareable) - *externalization*, from explicit to explicit (making more complex and systematic knowledge) - *combination*, from explicit to tacit (as in when a person absorb codified information and convert it to tacit personal knowledge and act accordingly) - *internalization.* Through these types of knowledge conversion, individuals share the knowledge, create new one and organizations improve their knowledge base both in quantity and in quality.

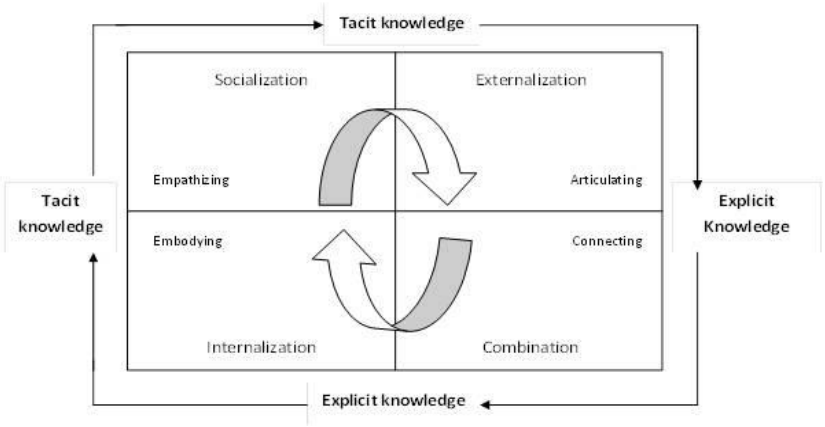


Fig. 2. SECI model of Knowledge creation (Nonaka, Takeuchi, 1995)

1.2 Knowledge Management

1.2.1 Definitions

The theory of knowledge management (KM) has been well developed since the first articles in this field were published in the beginning of 1990s. One of the first authors contributed to the idea were Peter Drucker ("The Landmarks of Tomorrow", 1959), who have put knowledge and information in one line with capital, labor and land as an organizational resource. Later on Peter Senge ("The Fifth Discipline: The Art and Practice of Learning Organization", 1990) has turned to the learning ability of organization as to the new strategy that could help the company to adapt successfully to the ever-changing business environment and survive in the wild competition. This description of the ideal organizational environment has basically reflected what the company should be to enhance KM strategy (Garvin, 1993). Leonard-Barton ("Chaparral Steel: Rapid Product and Process Development, 1991) in his turn has described the first case of the company who has adopted KM strategy. After that the first conference fully dedicated to KM was held in Boston in 1993, which Prusak has named a "good milestone to mark the beginning of the knowledge management timeline" (Prusak, 2001, p. 1003).

Since then the knowledge management extended as a field of study and several different theoretical schools emerged. Earl (Earl, 2001) has classified and mapped knowledge management. He said that there are 7 schools, which can be grouped in 3 categories: technocratic, economic, behavioral. The taxonomy developed by Earl you can see in the Table 1. Each group represents a number of sub-groups and they differ by following attributes: focus, aim, unit, critical success factors, principle IT contribution, "philosophy". Doing this taxonomy Earl also did several case studies and appointed an "ideal example" to each sub-group.

The technocratic group included systems, cartographic and engineering, and is based mostly on usage of information and communication technologies. (ICT). Those schools of KM capture, organize, map knowledge, create knowledge repositories and data bases and provide employees just-in-time information.

The economic group includes only commercial school of thoughts that focuses on an income. As a consequence, they perceive knowledge mostly as if it is a material asset that have a direct monetary value to the company. So, they value the most know-how, patents, licenses and other intellectual assets.

The third group is behavioral and includes organizational, special and strategic schools. In that sense the right culture nurturing trust, knowledge sharing and idea creation is the most important. The success factors of KM become sociable culture, knowledge intermediaries, design and encouragement. We may also say that behavioral group reflect also concepts of learning organization and updating the organizational space to the borderless community for easy knowledge flow. The strategic school here supports all the ideas mentioned above but focuses more on the big corporate picture and the point of turning knowledge into the long-term competitive advantage.

School / Attribute	TECHNOCRATIC			ECONOMIC	BEHAVIORAL		
	Systems	**Cartographic**	**Engineering**	**Commercial**	**Organizational**	**Spatial**	**Strategic**
FOCUS	Technology	Maps	Processes	Income	Networks	Space	Mindset
AIM	Knowledge Bases	Knowledge Directories	Knowledge Flows	Knowledge Assets	Knowledge Pooling	Knowledge Exchange	Knowledge Capabilities
UNIT	Domain	Enterprise	Activity	Know-how	Communities	Place	Business
EXAMPLE	Xerox Shorko Films	Bain&Co AT&T	HP Frito-Lay	Dow Chemical IBM	BP Amoco Shell	Skandia British Airways	Skandia Unilever
CRITICAL SUCCESS FACTORS	Content Validation Incentives to Provide Content	Culture/Incentives to share Knowledge Networks to Connect People	Knowledge Learning and Information Unrestricted Distribution	Specialist Teams Institutionalized Process	Sociable Culture Knowledge Intermediaries	Design for Purpose Encouragement	Rhetoric Artifacts
PRINCIPAL IT CONTRIBUTION	Knowledge-based Systems	Profiles and Directories on Internets	Shared Databases	Intellectual Asset Register and Processing System	Groupware and Intranets	Access and Representational Tools	Eclectic
PHILISOPHY	Codification	Connectivity	Capability	Commercialization	Collaboration	Contactivity	Consciousness

Table 1. Schools of Knowledge Management (Earl, 2001)

Nowadays, KM is defined differently in each industry accordingly to the specifics of its implementation and usage of tools. Girard&Girard (Girard, Girard, 2015) has stated that two most cited definitions are the following:

> *Knowledge Management is therefore a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance (O'Dell & Grayson, 1998).*

> *Knowledge Management draws from existing resources that your organization may already have in place - good information systems management, organizational change management, and human resources management practices (Davenport and Prusak 1998, p. 163).*

Doing the semantic analysis of definitions available from different industries, Girard&Girard (2015) counted most frequently used words when defining KM. They came to the conclusion that the most universal definitions of KM is:

> *Knowledge Management is the process of creating, sharing, using and managing the knowledge and information of an organization.*

In fact, this definition can be considered too general, because it simply describes the basic and most important knowledge-related processes without emphasizing the goals of KM, nor its value to the organization. Drawing important message from three definitions mentioned above we can say that KM is a multi-disciplined approach (Davenport, Prusak, 1998) to achieving organizational objectives (or improve performance by the words of O'Dell and Grayson (1998)) by the best use of knowledge (Liu, 2007). It helps firms to perceive knowledge as a real asset, better protect, develop and exploit it, enhances its innovative capabilities and helps to improve skills and core competencies.

1.2.2 KM Components

KM is the complex managerial approach that includes several components that company should possess or develop in order to enhance KM. The recognized framework is developed by Desouza (2011), which is KP^2T - Knowledge, People, Processes and Technologies. This approach reflects what should be managed successfully in an organization in order for KM to bring benefits. As we have discussed **knowledge** in part 1 of Chapter I, we would like to continue directly with other three main components.

People. As is cited from the same book (Desouza, 2011) **"**Managing knowledge begins, and ends with, empowering humans within and across the organization". It is similar idea to ones of Nonaka (1995) about "ba" - the right people in the right time and place are able to create new valuable knowledge for the company. Individual knowledge should be shared to become an explicit, collective and organizational knowledge. For that it is important to create the right culture (Davenport, 1996), nurturing openness and trust. It is crucial that employees are not scared to share their knowledge because of thought that they would lose their values (Gold, 2001).

Processes are business processes that facilitates knowledge sharing. There could be number of processes, which are defined from the organizational goals. When the processes and structure favorable for knowledge creation and sharing are defined, the required technologies are provided. **Technologies** serve KM as a facilitator for knowledge capture, codification, storage, sharing and access. They ensure knowledge flow through the organization and support needed business processes. As Desouza reminds, technology plays merely the supportive role, whereas people are the focus of KM.

The other theory which was used in several empirical researches as a framework for surveys was developed by Gold et al (2001). Those surveys are dedicated to assess KM practices in an organization. Contrary Desouza's theory, this one discusses not what should be managed, but what does the organization should have in order to say that KM elements exist there. It includes two groups: Knowledge Infrastructure and Knowledge Process capabilities of organization (fig.3). The first group includes Technology, Structure, Culture, which are similar to People and Technology.

Culture refers to organizational culture, that should nurture trust and openness, learning and idea creation in order for knowledge to be created and transferred successfully. Corporate vision and organizational values also play important role in KM adoption. Chang and Lin (2015) did an empirical research and found out some dimensions of organizational culture that have positive effect on KM processes in organizations. They have discovered, that companies, which have more successful knowledge creation, transfer, storage and application processes, are more

likely to have result-oriented and job-oriented (contrary to employee-oriented) cultures. On the contrary, tightly controlled closed companies, also where employees stay loyal to the profession, not to the company, have difficulties with those knowledge processes.

Structure contributes to the organizational culture. Whether it is flat or not, the knowledge flow should go upside and downside equally, the knowledge shared between employees and managers allows to learn and improve business processes (Sanchez, 1996). According to Mahmoudsalehi and Moradkhannejad (2012) organizational structure in theory usually is divided into four categories: formalization, centralization, complexity and integration. Formalization refers to the number of rules, standards and norms that employees are supposed to follow. Centralization reflects the extent to which a power is concentrated in the top levels of a company. Complexity describes the distribution of roles, tasks, goals, responsibilities and the degree of autonomy. Integration is a degree to which the activities of separate players in the organization can be coordinated through formal mechanisms. The results of the research showed that less centralized and formalized, but more complex and integrated organizational structures have better chances to have more effective knowledge creation, sharing and utilization.

Technology is always underlined to be secondary after culture when talking about introducing KM to a company. Subashini et al. (2012) noted that technology can help manage both explicit and tacit knowledge. Usually, it is clear, that explicit knowledge is codified and stored in document libraries, wikis and yellow pages, knowledge portals and many more. Concerning tacit knowledge, ICT is in place here for knowledge sharing and creation: collaborative platforms, videoconferencing, intranets. The main functions of technology in terms of KM has been identified as being a facilitator between people and knowledge processes.

Knowledge Process capabilities, in their turn, are divided into 4 subgroups: Acquisition, Conversion, Application and Protection Process. **Acquisition**-oriented knowledge processes include every process that relate to idea-creation, knowledge-sharing, collaboration with insiders and outsiders to generate new knowledge etc. It mostly concerns obtaining and accumulating knowledge from internal and external sources and generating knowledge through idea creating and data and information analysis. The company should answer the question whether or not it has processes to acquire knowledge from all stakeholders. **Conversion** processes are to combine, organize, integrate, structure, coordinate and distribute knowledge. It is to replace outdated information with the new one, to integrate knowledge of several individuals and create consistency. Conversion talks previously accumulated or generated knowledge useful and making it in any forms applicable for a company. **Application**-based processes are making it easy to apply knowledge in actual business processes. Usually it means easy access to the knowledge storage

for whomever needs it and wherever she or he needs it. Created or acquired and codified knowledge should go into company's business processes and applied for customers' services or product development. Knowledge application is about making "knowledge more active and relevant in creating value" (Bhatt, 2001). **Protection** processes insure that the strategic knowledge doesn't end up in wrong hands, it usually includes official means of protection (patents, licenses) and unofficial (NDAs, personal accounts in intranets, employees' agreements) (Mills, 2010).

Other frameworks for classifying KM processes and practices can be seen in the table 2. More or less, there are similarities in all those classifications. As such, seven major categories can be identified: identification, acquisition/generation, organization, storage, distribution or sharing, application and measurement (Khalifa, Shen, 2010). Three of them were not discussed yet, but they were essentially incorporated into framework by Gold. Identification process includes determining knowledge gap in company's strategic knowledge and finding internal or external resources to fill that gap. The third process is knowledge organization which refers to the classification, structuring, coordination, linkage, integration, indexing and editing processes of the acquired knowledge (Alavi & Leidner, 1999). Knowledge measurement refers to setting goals and checking their achievements, revising KM strategy and goals. Thus, KM process capabilities define the focuses of KM efforts and enable the above KM processes in an organization. (Grant, 1996).

Classifications	**Knowledge Processes**
Alavi and Leidner (2001)	Creation – Storage – Transfer – Application
Gold et al. (2001)	Acquisition – Conversion – Application – Protection
Ernst&Young (1999)	Generate – Represent – Codify – Apply
Holsapple et al. (1997)	Acquire – Select – Internalize – Use – Generate – Externalize
Young (1999)	Acquire – Develop – Retain – Share
Wiig (1998)	Leverage existing knowledge – Create – Capture and Store – Organize and Transform – Deploy
Liebowitz (2000)	Transform – Identify and Verify – Capture and Secure – Organize – Retrieve and Apply – Combine – Learn – Create – Distribute/Sell
Liebowitz et al. (1998)	Identify – Capture – Select – Store – Share – Apply – Create – Sell
Saint-Onge (1998)	Gather – Learn – Transfer – Act
Van der Spek et al. (1997)	Develop – Secure – Distribute – Combine

Table 2. Classifications of Knowledge Processes (Khalifa, Shen, 2010)

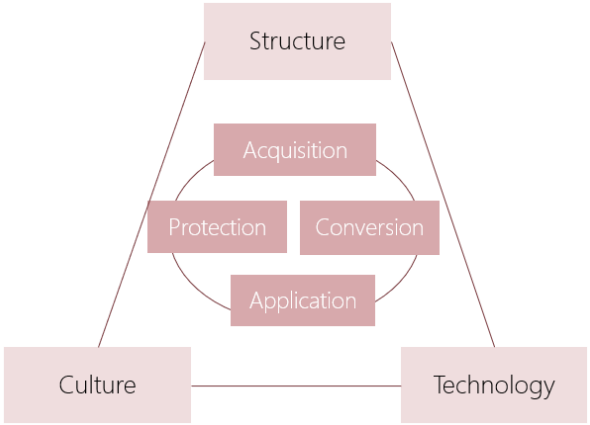


Fig. 3. Unity of Knowledge Management Capability. (Chan, Chao 2008)

1.3 Small and Medium Enterprises

1.3.1. Peculiarities of KM in SMEs

Small- and Medium-sized enterprises have different organizational structure from corporations. They also have different business-processes, employees' relationship and functional divisions. All that leads to the fact, that several peculiarities should be taken into account when introducing KM in SMEs. The existent studies indicate that KM processes in not about the smaller-scale KM frameworks from the big players in the market, but they have considerable differences (Desouza, Awazu, 2006). SMEs usually have limited capital and human resources: they do not have the capacity to appoint particular person as a knowledge manager and they do not have money to spend on additional cloud servers and IT development. That is why knowledge at SMEs is more tacit in nature and is created "ad hoc" (Egbu et al., 2005). Instead, they have better HRM practices, less corporate and less uniformed, which makes the introduction and understanding of KM better and the knowledge flow easier. It also indicates that managers do not have sources to hire best minds and super-qualified people in their industries, so the education and trainings are always in place when a new employee is hired. The other difference of SMEs is their competitive advantage coming from differentiation and customer experience rather than low-price and economy of scale (Zanjani et al, 2008). SMEs tend to listen more to their clients and pay attention to their reputation in local community. Hence, the knowledge they need comes from outside more than from inside the company.

Desouza and Awazy (2006) have published 5 peculiarities for KM at SMEs:

1. **Dominance of socialization in the SECI**

Socialization is the conversion of tacit knowledge of one person to tacit knowledge of another through shared experience (Nonaka, Takeuchi, 1995). In all SMEs research by Desouza and

Awazy the knowledge transfer occurs through formal and informal socialization methods. It is the consequence of small number of people working at small enterprises and lack of formal organizational memory. Owner or managers her/himself acts as a knowledge repository due to the private nature of such companies. The knowledge usually flows from tops to downs with employees rarely showing initiatives. At the end it helps to build organizational culture based on mutual affection, trust and facilitates knowledge flow.

2. **Common knowledge**

While in big corporation knowledge irregularly distributed among different people and different divisions, small and medium enterprises have a distinction - everybody knows the same, so that in case one employee can fill in for another. It also means that the knowledge transfer is very fast, everyone knows the context, so it is very easy to speak in specific terms.

3. **Knowledge loss is not a problem**

Taking into account what was said before, the serious knowledge loss at SME can occur only when manager or the owner quit her/his job. In the case when manager is the owner, the enterprise ceases existing. In the case when manager is not the owner, it is very easy to replace this person with the next most qualified or the longest employee.

4. **Exploitation of external resources of knowledge**

Lack of resources for launching researches internally leads to effective use of external resources of knowledge. SMEs more often than big companies rely heavily on the information coming from outside: customers, competitors, employee's experience, suppliers etc.

5. **People centered KM - technology in the background.**

Large organizations put their resources into heavy technology infrastructure that often become the center for KM practices. SMEs have more humanistic and, in opinions of researchers, the right approach. Because people are the ones who generate knowledge and should be willing to share it, KM practices should be human centered to get the process running. So, knowledge at SMEs flows directly from one person to another without being stocked in a virtual database with no use.

Takin into account all mentioned above, it is said that SMEs cannot adopt the same strategies of KM as large organizations (Bolisani, Scarso, 2015). Although it would be the easiest way because there exist a lot of frameworks, SMEs usually have their own way of implementing, knowingly or unknowingly, KM practices (Salojarvi et al., 2005). SMEs are often using "informal KM" without the support of extensive IT systems (Nunes et al., 2006). As a result, they are more efficient on the level of tools and systems in managing tacit knowledge (Edvardsson, Durst, 2013).

Also, SMEs are usually restraint in financial and human resources, they lack dedicated personnel, that would keep in line knowledge management for the whole time being of the company. Managers of SMEs also find it difficult to invest into KM, because they focus more on day-to-day operations rather than on the strategic view and see more benefit in short-term investment in the company (Nunes et al., 2006).

1.3.2. KM tools for SMEs

Beijerse (2000) in his empirical study found the 79 different tools related to KM used by SMEs, most of which employed 25 or less people. At the same time, they notice that those instruments do not indicate the presence of actual management of knowledge in the company. Mostly, they are used in the non-systematic and inefficient way. They are so called "ad hoc" tools, used for acquiring, sharing, evaluating and developing knowledge. Krajnović (2012) also indicated this notion, while investigating KM at SMEs in developing countries. They advise the enterprises to develop more systematic approach to the KM in form of the continuous learning. It is also mentioned there that SMEs suffer from the lack of professional expertise in this area, especially in developing countries, which is also concerning Russia.

An extensive research by Babakhanlou and North (2016) has identified 16 toolkits in different languages developed by different companies. It is indicated that the most frequently tool mentioned is Communities of Practices, After-action-review, peer assist, Social Networking and Brainstorming. Other tools mentioned more than 3 times out of 16 are: Exit Interviews, Document Libraries, Knowledge Fair, Lesson Learned, Knowledge Cafe, Storytelling, V2V (internet protocol), Collaborative Virtual Workspaces, Knowledge Mapping. Below the short description of each tool is given from the "Knowledge Management Tools and Techniques Manual" (2010).

Communities of Practice are intentionally or unintentionally gathered groups of experts or just interested people by the common topic, that they want to share, develop and improve amongst each other to deliver those improvements for the good of a company.

After-Action-Review (ARR) is a session taken place after some major project or major event with all participants included, which is meant to analyze the goods and the bads of the project. The lessons of AAR are documented and are ready to be extracted whenever similar project is going to happen again. The bad experiences written down with the instruction of how to behave differently next time in the similar or same situation are **lessons learned**. Although to be so, ideally, they need to be embedded into company's processes and implemented, thus, saving time and money for the company by not making the same mistake twice.

Peer Assist could be a part of Before-Action-Review or During-Action-Review. Project team meets expert of the field or person with the similar experience (peer) to explore in-depth the peculiarities of the project in order to avoid as much as possible mistakes and to proceed smoothly with the tasks.

Social networking is a process of finding and connecting with people of shared area of interest. Usually companies help this process by introducing social network services, like Intranet (inside social network), videoconferences, or Knowledge Fair. **Knowledge Fair** is different in a sense that it is an open platform (physical or virtual), where people offer their knowledge and expertise in exchange for the same from another person. Here people can match their knowledge into the area of expertise and expand their social network.

Knowledge Cafés is a concept of meeting in an informal and relaxing place in order to have open and creative conversation with people that touches somehow the area of improvement. It helps, for example, to generate insights on how to improve customer service, or to create idea on a new product. **Brainstorm** is the other useful tool to generate new knowledge. Unlike previous example, it is an intensive session, broken into two parts: one is generating ideas without any judgment, two is evaluating those ideas in positive manners and leaving only relevant on the table. As a result, a company get quickly a list of options for the given problem.

Storytelling is a way to transfer knowledge through the company. Lessons Learned and valuable experience is easier to perceive through short emotional stories with people and roles involved. It is also used to present company's organizational culture and to install right values across geographically dispersed company's units. **Collaborative virtual workspaces** and document libraries also serve to the transfer of the important information and knowledge, but in more formal way. Virtual workspaces allow people being in different places still work together and communicate. **Document Libraries** are first a place to keep the knowledge. Nevertheless, it is highly important, that those libraries are easily accessible, otherwise, the knowledge will be just lying there with nobody using it.

Knowledge Mapping and Exit interviews are the ways to codify the knowledge existing as personal and tacit as an explicit one. **Knowledge mapping** allows to identify and write down existing expertise, processes and technology. It then serves as easy to use navigator to find required knowledge asset in a minimum time. **Exit interviews** are aimed at capturing and codifying the knowledge of an expert ready to quit a company. This information is useful for integrating a successor into a company. Exit interviews can include the review on a company and on managers from quitting person and can be used for general improvement of an organization.

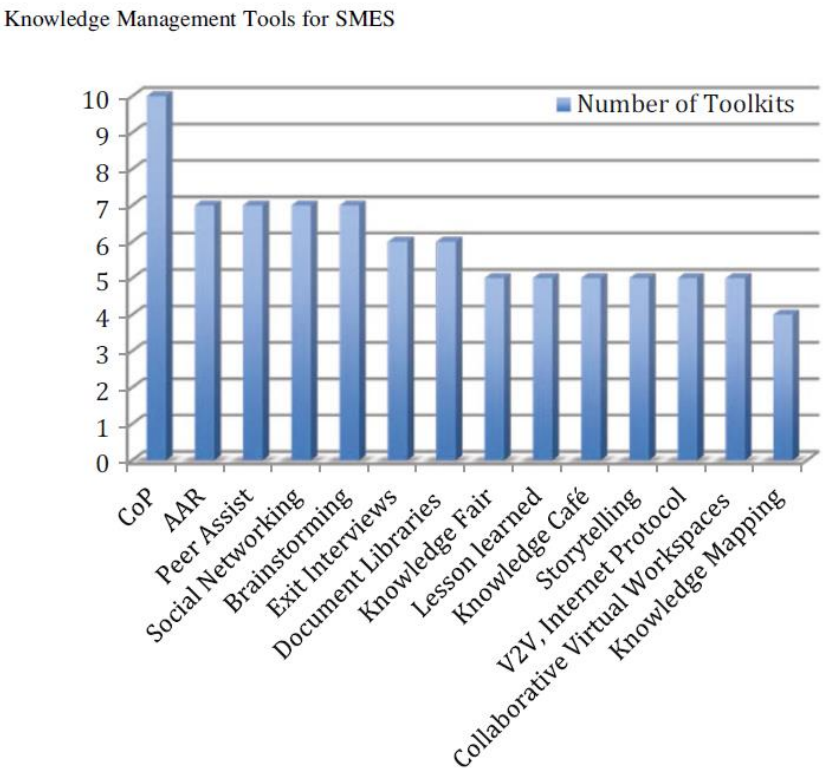


Fig. 4. Coverage of tools in the analyzed toolkits (Babakhanlou, North, 2016)

Knowledge Processes / **KM Tools**	Acquisition	Conversion	Application
Communities of Practices			
After-Action-Review			
Peer Assist			
Social Networking			
Brainstorming			
Exit interviews			
Document Libraries			
Knowledge Fair			
Lesson Learned			
Knowledge Café			
Storytelling			
Collaborative Virtual Workspaces			
Knowledge Mapping			

Table 3. Linking KM Processes by Gold et al. (2001) framework to KM tools

All the KM tools are used correspondingly to their goal (knowledge acquisition, sharing, storing, applying etc.), some of them serve several goals, and the link to a company's strategic goals should be made. Going from the strategic goal a company identifies which knowledge does it need and how should it proceed with that knowledge. Like that business processes of an organization align with knowledge management processes (Babakhanlou, North, 2016).

1.3.3 Russian context

Russian Federal Law defines small and medium enterprises by the number of employees and maximum annual revenue. Small enterprises are employs up to 100 people and has annual revenue not bigger than 800 million rubles. Among them there is subgroup of microenterprises, which have maximum of 15 employees and 120 million rubles annual revenue. Medium enterprises have to have 101-250 employees and maximum yearly revenue of 2 billion rubles (Federal Law, revised 2017).

According to Deloitte report for the last quarter of year 2016, there is total of 5.67 million SMEs in Russia registered as at September 1 2016 and 95% of those are microenterprises. All together they make 41.9 trillion rubles per annum. They employ 12 785 000 people, 11 million of those works at small enterprises (Rosstat, 2017). 45% of all SMEs are in retail or wholesale trade, 23% are in real estate, 13% - construction, 11% - manufacturing, 8% - transport and communication.

We find it also important to put information about Russian management style, because it definitely has impact on KM processes in Russian SMEs. First, analysis through Hofstede's Model (1983) shows that Russia has high level of power distance, which means that Russians are used to hierarchy and unquestioning obedience. Most probably, the same thing leads to lack of initiative from employees and their expectancy of management doing everything for them. Russia is also on the high level of uncertainty avoidance and long-term orientation, that could lead to the resistance to change and risk taking. It is highly common that Russian employees can take a change in the organization, but only when the steps and expected results are laid down with details.

The lowest scores are those of individualism, masculinity and indulgence. Russia is a quite collectivist country; people hold on to their relationships as one of the ways to get useful information or to get well in life through connections. More specific insight comes from Fon Trompenaar's cultural model (1997), which says that people put relationship even over rules. At the same time, the collectivist nature gets people restrained with social norms - it is somewhat shamefully to be different, to want to have more than your family and friends have, the wealth should be distributed equally. It is highly important to praise a group work during common meeting, but individual only when speaking one-on-one. People tend to like what they have now,

to be, rather than to do and change something in the future, where they look with cynicism and pessimism.

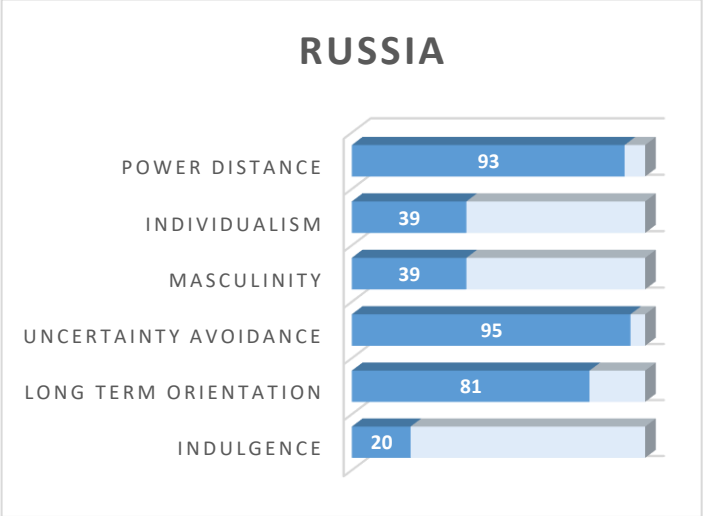


Fig.5. Hofstede's Model for Russia

According to Hall's model (1976) Russia is a high-context culture. It means that whenever a conversation is taking place, it is crucial for Russians to take into account the context, relationships with interlocutor, surrounding environment, non-verbal body language, traditions, culture - everything matter. Russians will not take the words directly as they are but rather read between the line and expect the same from the interlocutor.

To conclude everything, Holden (2013) said that Russian distrust towards legitimate institutes and dependency on informal ones, such as ethics and culture, limits Russian business when adopting KM practices. It excludes business strategy and corporate governance as motivational tools proven as efficient in Western countries and holds back economic progress. Andreeva, Inkhilchik (2009) notes that favorable for KM decentralized and flat structure can be a rare occasion in Russian companies, since managers fear to delegate responsibilities to their employees. Moreover, high power distance contradicts with open dialogue between managers and employees and serve as a barrier for knowledge sharing in an organization. Researchers offer some tools that will theoretically help to overcome the barriers. For example, on the first stages of knowledge sharing introduction negative rewards could be useful (Michailova, Husted, 2003) or that initial learning and training could be helpful when explaining managers and employees that knowledge sharing and collaborative work has actually more perks than disadvantages (Andreeva, Inkhilchik, 2009).

Moving from abstract things to KM practices in Russia, the research was conducted in 2014 (Lavrov, KM-alliance, HSE, 2014), mostly among large business, ¾ of those companies has more

than 1000 employees, so it does not reflect the reality of KM for SMEs in Russia, but it does give a good general picture of KM practices in Russia. According to this research, 21% of the companies adopted KM practices are in banking and financial services, 16% is in FMCG, 13% in manufacturing, 11% in IT and telecom and 11% is in retail. Russian companies consciously practicing KM can be divided to following types:

- Large business working in global markets
- Large and medium business – industry leaders or reaching out to be leaders
- Medium business found in active stage of organizational change or exploring new markets
- Small and medium business with high level of managerial engagement in searching ways of survival

Although the research shows that the percentage of Russian companies interested in KM increases every year, their practices are still far from the practices of foreign colleagues. It is seen in unsystematic approach to the KM and in the fact, that only parts of KM practices are being incorporated into companies' business processes: knowledge identification, knowledge creation, knowledge sharing and knowledge storage.

The other research on large companies – leaders in KM practices in Russia – has supported the idea, that companies lack integration of their knowledge processes with their business processes and strategic goals (Budlyanskaya, 2015). Or, as the other researcher indicated, Russian KM systems mostly remind of massive and maybe systematic, but passive document storage (Kelchevskaya, Stukova, 2015). Research, lead in manufacturing companies over 100 employees, has discovered, that organizational learning and knowledge protection are two most practiced in Russia in that industry. At the same time, KM in manufacturing companies lack strategic knowledge, organizational design and involvement of management in KM practices (Andreeva et al. 2015).

Other research papers made recently exploring Russian practices concerned KM practices and business effectiveness. Latest results showed that application of KM and development of Intellectual capital influences positively performance indicators of Russia manufacturing companies, but at the same time not all practices have high effect. In particularly, technology KM practices plays significant role in enhancement of intellectual capital components, thus increasing performance indicators (Andreeva, Garanina, 2017). Those results were also verified in the case studies with companies in Block of Refining, Petrochemistry, Gas Processing of the PJSC «LUKOIL».

There is also some research made on customer orientation and knowledge management in Russian companies, where it was empirically proved that customer involvement in new product

idea creation and development in a company's processes leads to higher income of such a company. The importance of customer knowledge base was also underlined (Gulakova, Rebyazina, 2015). Research of KM in operations management in Russia has led to a development of the methodology for context-oriented KM for decision support and model of production networks that uses this methodology (Sandkuhl, 2016; Smirnov, 2016). The other observable track of works on KM in Russia includes tools and methods for working with knowledge for strategic management and organizational development (Kudryavtsev, Gavrilova, Kuznetsova, 2017).

1.4. Organizational Performance

Organizational Performance (OP) is the concept on which there are a lot of arguments in academic circles. There is still no commonly accepted definitions and norms of measurement of organizational performance. (Jenartabadi, 2015; Cameron, 1986). OP is set as a KPI for all the departments in a company (Hult et al., 2008; March, Sutton, 1997; Richard et al., 2009) and it is usually defined as a central measure for improving business profitability and ensure long-term survival (Bititci et al., 2012; March, Sutton, 1997). Or, using easier definitions, OP reflects the nature and quality of an action performed in a company to achieve its primary functions and tasks to produce profit (Sink, 1991). Some of the authors (Kaplan, Norton, 1992) sais that OP complies with organizational goals and objectives and is defined financial and non-financial indicators. Sometimes, there is a distinction between OP and organizational effectiveness. In particular, OP refers mostly to quantifiable and financial indicators, such as revenues and dividends paid to shareholders, whilst organizational performance can be represented by customer satisfaction and corporate social responsibility (Richard et al., 2009). One of the broadest definitions of OP is "the capability and ability of an organization to efficiently utilize the available resources to achieve accomplishments consistent with the set objectives of the company, as well as considering their relevance to its users". In other words, this definition makes a logical connection between "effectiveness" of a company in terms of organizational goals, "efficiency" in terms of using resources and "relevancy" in terms of taking into account stakeholders' interests (Peterson et al., 2003).

1.4.1 Assessing Organizational Performance

As much as there are discussions about the definitions of OP, there are discussions about OP measurement. The simplest way is to use financial ratios (ROA, ROE), market outcomes

(market share, stock prices, growth), HR-related outcomes (job satisfaction, commitment and others) or organizational outcomes (productivity, service quality, new product development and others) (Jenatabadi, 2015).

The other way to measure OP used in several research works is to gather subjective views from managers, employees and owners on their company's OP. As such it is possible to ask manager the perception of customer satisfaction of their company in comparison with the same indicator of their competitors. Some argues, that managers can be biased in their judgments and objective OP measures are more robust (Bjorkman and Budhwar, 2007; Dess and Robinson, 1984; Fey, Bjorkman and Pavlovskaya, 2000; Powell, 1992; Razouk, 2011). Nonetheless, subjective assessment of OP is popular in management field, because of the often inability to collect objective data in chosen countries or organizations, or of difficulties to compare objective performance indicators in the international context (Hult et al., 2008). That is why numerous studies have been conducted to prove the robustness of subjective measures. All of them showed significant correlation between objective and perceived performance measures that allows to use the latter for researches (e.g., Collins, Smith, 2006; Coombs, Gilley, 2005; Flanagan, O'Shaughnessy, 2005)

It is also claimed that smartly set performance measurement contribute to the employees' motivation and company's growth (Jenatabadi, 2015). For example, monitoring business progress refers to setting business goals, measuring their achievement and correcting the track. Achievement of long-term goals can be controlled through measuring the impact of strategies and plans. Regular outputs of OP can help to detect in time company's problems and even make a diagnosis. OP measurement also supports decision making by providing managers with facts and numbers instead of relying on judgments and assumptions. Lastly, OP measurement serves as facilitator for communication and motivation in a company by displaying current and desirable status of a company. All in all, performance measurement is a powerful tool for effective management (Rolstadås, 1995; Waggoner, Neely, 1999)

1.4.2 Knowledge Management and Organizational Performance

If we are defining OP as "the capability and ability of an organization to efficiently utilize the available resources to achieve accomplishments consistent with the set objectives of the company" (Peterson et al., 2003), KM is about improving the efficiency of resource usage (Mills, 2010) through effective management and improved information and knowledge flow within the firm (Lee and Sukoco, 2007). KM can also be used as a strategy and main driver of organizational change, when a company struggles for survival (Kettunen, Chaudhuri, 2011).

More detailed researches showed that KM practices were found to be positively correlated with customer intimacy, product leadership, operational excellence (operating costs), which then influence positively financial performance (McKeen et al., 2006). Also, KM practices were proven to influence positively on sales growth, quality improvement and customer satisfaction (Gharakhani, Mousakhani, 2011). Finally, KM practices usually are linked with the level of innovativeness and improved organizational learning (Reige, 2007), which is usually said to be the consequence of enlarged organizational capabilities to create, transform and distribute knowledge.

Omotayo (2015) has also identified the following intermediate benefits of introducing KM practices to a company:

- Improving business decisions thanks to facilitated access to expertise and to leading practices
- Increasing efficiency, productivity and work smarter by reducing cases of "reinventing the wheel"
- Improving innovation through wider and borderless collaboration
- Reducing loss of know-how by capturing explicit and tacit knowledge
- Speeding productivity with on-board trainings and timely access to knowledge
- Increasing client satisfaction by delivering value insights
- Enhancing quality and ability to collaborate by standardizing ways of working and enabling discussions with leading experts

However, academic literature reveals that knowledge management initiatives usually take time and commitment to show return on investment. The numbers show that most companies experience significant improvements after a few months, but some companies need 9-12 months to experience a payback (Tobin, 2014). At the same time practitioners must keep in mind, that return on investment in KM can be expected only when practices and processes are aligned with company's business processes and strategic goals (Roche, 2013)

1.5. Research problem statement

1.5.1 Practical relevancy

Different specialists are stating that Russian economic model based on natural resources cannot be the driver of economic development anymore, and SMEs can contribute significantly to Russia coming out of recession and moving towards stable growth (Kondratiev, 2017). According to the "Strategy of development of SME for 2030" (2016) by Russian government, there is a goal

to increase share of SME in Russian GDP from 20% to 40%. The government is taking some measures in terms of financial and legislation aid, but so far a lot of SMEs have difficulties to stay in business. For example, in 2016 10% of individual entrepreneurs closed their business (PwC, Levada-centre, 2016). For the companies themselves it is important not only start the business, but also stay efficient, profitable and competitive.

Therefore, current foreign researches indicate that KM works in SMEs and contributes to the improvement of organizational performance. Overall, the literature review indicates that the most frequently mentioned benefits for SMEs from adopting KM or using KM tools are improving performance indicators, like grow revenue and sales, cut losses, improve processes, increase productivity (Edvardsson, 2006). Or, other, KM contributes to employee development through better knowledge flow and learning techniques and customer satisfaction through knowledge creation and innovation (Migdadi, 2009; Wei et al., 2011). In some way implementation of KM practices could very crucial for the company, if knowledge and know-how are their only key resource (Ruggles, 1998).

Mentioned above results make wondering if current KM practices in SMEs in Russia have the same effect on their organizational performance. If it is true, then it would be possible to give recommendations to SMEs on which practices are better to develop and how to develop keeping in mind the specificity of SMEs (human resources and capital restrains, prevalence of informal communication and tacit knowledge).

1.5.2 Research gap

KM became a trend to follow for many large organizations (Desouza (2011) as they realized that they are competing on their intellectual capital. As in many cases before SMEs are currently left behind and the number of researches about KM practices in small-sized enterprises are much less than the same researches about big organizations. Moreover, very often SMEs are unaware of the existence of Knowledge Management. All SMEs knowingly or unknowingly manage knowledge (Desouza, 2011). While KM practitioners in Russia work mostly for big corporations, SMEs are usually the drivers of economies and indicators of the healthy economic system.

In Russia KM is known in academic circles and taught at the universities, but there are not much serious researches made recently. The companies known for implementing KM practices are the big corporations that tries to follow the global trends (Gazprom, Lukoil, Oboronprom). Others either not very well-known, either do not demonstrate publicly the use of KM practices. The actual Russian papers indicate that the topic of KM is interesting to the researchers, but not

deeply developed, since all the articles are about reviewing the western studies and practices (Andreeva, Garanina, 2015). The main directions for research of KM and Russian companies are KM and Intellectual capital (Andreeva, Garanina, 2015, 2016, 2017; Sopegina 2018), organizational architecture and KM (Kudryavtsev, Arzumanyan, 2016, 2017), KM and HR (Tolstyakova, 2012; Gorbunkova, Makarova, 2017), customer knowledge (Golovacheva, Smirnova, 2017), KM in manufacturing companies (Andreeva, Garanina, 2015; Abdullina, 2012; Skvortzov, Guskova, 2016). So, the number of published research papers on KM and Russian SMEs is insignificant. At the same time a lot of more differentiated researches can be seen to be conducted abroad, for example, the factors affecting KM; the impact of KM on firm's performance; the knowledge management systems (Cerchione, Spadaro, 2015).

By the example of our colleagues abroad, we would like to offer a research that would assess KM practices in small and medium-sized enterprises in Russia. It would also explore the scope of influence of KM practices on organizational performance in its current state. In turn, it would be reveal evidences for recommending KM practices to SMEs in Russia.

1.5.3 Research problem & questions

To fill out stated above research gap this paper states the following **research problem:** increase the understanding of KM in the context of SMEs in Russia and confirm a link between KM practices and organizational performance in SMEs in Russia.

Research questions:

1) Which types of KM processes and practices are more developed in Russia among SMEs?
2) How do KM practices correlate with organizational performance in Russia?
3) Which KM practices correlate in which way with organizational performance in SMEs in Russia?

1.5.4 Managerial Implications

This research has high potential to prove, that use of KM practices and processes in SMEs in Russia influence on their organizational performance and give incentive to managers and owners of such companies to adopt some of KM tools or comprehensive KM strategy. As this work also describe which KM processes influence the most and the least on organizational performance, it is possible to advice managers where in area of KM it is more efficient to pay attention and invest money to.

Summary of Chapter I

Knowledge Management (KM) has been a widely discussed topic in managerial literature. All types of companies, not only knowledge-intensive, need to manage their tacit and explicit knowledge flow in order to make their business processes more efficient, spend less time of searching for expertise, improve learning processes, reduce knowledge loss when personnel are quitting and enhance customer experience (Edvardsson, 2006). According to Gold et al. (2001), company's KM practices and processes are divided into two groups: company's infrastructure capabilities and process capabilities. First group says that effective KM depends on organizational culture, structure and technology support. Second group defined process capabilities as knowledge-acquisition, -conversion, -application and –protection processes.

Several researches conducted abroad in large and small companies showed that those capabilities, separately or all together influence positively on both subjective and objective organizational performance measures (Peterson et al., 2003; McKeen et al., 2006; Gharakhani, Mousakhani, 2011; Reige, 2007; Khalifa, Schen, 2010; Andreeva, Garanina, 2015). Moreover, recently, academics from countries, where academics recognized the importance of SMEs, started to learn KM practices and processes there closer (Migdadi, 2009; Wei et al., 2011; Bolisani, Scarso, 2015; Handzic, 2017). It has been said, that although SMEs unlike big corporations usually do not know about KM, they still manage knowledge in some ways (Salojarvi et al., 2005). SMEs have several peculiarities that differ them from large companies, so scaling down KM frameworks for corporation is not a good idea (Desouza, Awazy, 2006). Nevertheless, there are some KM processes and practices that are adapted and exploited by SME and their usage correlates positively with organizational performance (Lee, Lan, 2009; Chan, Chao, 2008; Gold et al, 2001; Zaied, 2012; Alavi, Leidner, 2001).

In Russia most of the attention is still paid to large organization that are trying to introduce holistic KM strategy (Lavrov, 2014). Literature review has not identified research exploring link of KM and organizational performance, whilst Russian strategic goals for 2020 includes increasing share of SMEs in Russian economy. Proving, that KM practices and processes serve to improve organizational performance, would be a good incentive for managers to adopt KM and develop this already popular in West managerial field in Russia.

Therefore, **research problem** is following: increase the understanding of KM in the context of SMEs in Russia and confirm a link between KM practices and organizational performance in SMEs in Russia.

Research questions:

Which types of KM processes and practices are more developed in Russia among SMEs?

How do KM practices correlate with organizational performance in Russia?

Which KM practices correlate in which way with organizational performance in SMEs in Russia?

CHAPTER II. Research Methodology

Due to the vast variety of research designs and methods, it is important to choose the most adequate for given research paper. Research design includes the research philosophy (ontology, epistemology, axiology), type of research paper (explanatory, exploratory, design science etc.), research approach (inductive, deductive), research strategy (qualitative or quantitative, choice of corresponding research methods), research tactics (how and where to collect data and how to analyze it). The appropriate research design assures the validity and reliability of the research results.

2.1. Theoretical overview

Identification of research methodology starts with defining the research philosophy. Generally, there exist three polar philosophies: epistemology, ontology and axiology (Fleetwood, 2005). The subject of **epistemology** is the knowledge itself, it answers the question "how do we know what we know?" There three main flows of thoughts on that say that either 1) the universal knowledge is out there, and people need to discover it; 2) knowledge is created and developed by people; 3) relativistic approach: knowledge is what we say it is. Epistemologists either ask right questions, gather data and get insights, "the true" knowledge out of it (positivism), or experience something to understand it and to know it, get the context or multiple causality (interpretivism). **Ontology** investigates the nature of reality, of humans, of society, of individuals. It answers the questions "who we are?" or "what are we doing here?". Ontological traces in the research can be noticed when a researcher chooses to treat human being as an individual independent from the society (positivism), or, on the contrary, as an unseparated part of a group (interpretivism). **Axiology** studies values and set the questions of whether our research will bring any values or whether the personality of a scientist influence on his or her research.

Next step in defining the research methodology is choosing research approach. According to Saunders et al. (2007) and Pathirage et al. (2008) there exist deductive and inductive approaches to the research. **Inductive** is concerned with building a theory from the data collected and it is more common for social sciences. This strategy is flexible, and it is used to understand the underlying meanings of the events. **Deductive approach**, on the contrary, is designed to test a theory by analyzing the data. It is common for natural science and usually used to explain the causal relationship between variables. It also allows to generalize the conclusions is the sample is of enough size.

The designs in research are divided into exploratory and conclusive (Malhotra et al, 2012). **Exploratory research design** is **qualitative or quantitative exploration** and is led to find

insights and understandings. It uses small samples, secondary data and qualitative research by doing surveys, unstructured observations, quantitative exploratory multivariate methods. This research is designed to identify possible problems in a research area and formulate hypotheses. **Conclusive research design** is more structured and is used to test hypotheses. That is why the analysis is going by the structured scheme, it is usually quantitative with the large representative data sample. It can be **descriptive** with the goal of describing interconnections in a phenomenon and use surveys and observations as a method. The other conclusive design – **causal** – is used to test and evaluate already known patterns with the help of experiments. Also, **explanatory research** is identified as a research design that usually follows descriptive analysis. It explains the motives lying under the hypothesis and correlations.

The last step would be to define methodology, which is basically quantitative or qualitative (Saunders, 2016). **Quantitative methods** are using surveys and experiments to quantify opinions and behaviors. This numerical data can be analyzed statistically to test hypotheses and be generalized on the whole population. Quantitative methods usually relate to positivist assumptions. **Qualitative methods** usually use interpretive assumptions to build their research. They take human being as a complex influenced by several factors. Therefore, qualitative methods use focus groups or interviews in order to go deeper than just uncover trends, but also to explore underlying reasons, opinions, motivations. Although, these are two different research methods, one work can easily combine the two of them, for example use quantitative methods to discover trends and qualitative to explore the drivers of this trend.

2.2 Research Strategy

This research is based on the positivist assumptions and ontologically assume that objects of my research - small and medium Russian enterprises – are, for the time of the research, isolated units not influenced by any outside forces. Epistemology of the research is represented by the fact, that we can get true knowledge from the data collected. The sample of the research – employees, managers and owners of Russian SMEs – were asked questions and gave the data that can be turned to knowledge of existed trends and correlations. This knowledge is claimed to be generalized to all the population.

As this research is meant to test the theory, that all SMEs knowingly or unknowingly practice KM and that the quality and quantity of KM processes and practices in the companies influences positively with their organizational performance, we are using deductive approach.

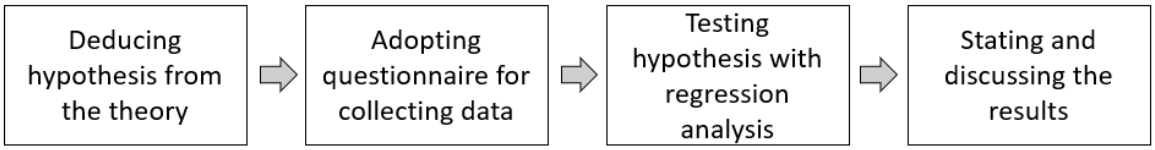


Fig.6. Research Strategy

As for research design, in this paper the two of them were used. First, exploratory research using critical literature review, finding research problem and formulating the research problems. Second, descriptive research design with quantitative methods in the empirical part is used to design a questionnaire, collect data, analyze it and test hypotheses.

By a theoretical background a questionnaire uses 3 types of questions: administrative, classification and target (Cooper, Shindler, 2006). Administrative questions have aim to identify respondents, their current location, emotional condition. Classification questions are grouping respondents by social or demographic determinants. And target questions are specific for the research and should take into serious consideration question content and question wording. According to Lancaster (2005) questionnaire should be concise, logical, have clear questions, avoid leading questions and use specific set of questions if possible. Same research work offered advantages and disadvantages to consider when using a questionnaire. On the bright side, it requires little special conditions and equipment to conduct and the results are easy and quick to analyze, especially when it is in Likert scale. On the other side, it does not provide the full picture comparing with in-depth interviews. But questionnaires are perfect for collecting quantifiable data, that is why it was chosen for this research.

By this approach we explain causal relationship between variables, where the independent variable would be KM practices and processes and dependent variable is organizational performance. We used questionnaire with close-ended questions to collect quantifiable data for statistical analysis and with open-ended questions to collect demographic data from our respondents and more data to describe the current state of KM practices in Russian SMEs.

Close-ended questions represent the statements, where respondents are supposed to show their agreement or disagreement using 5 points Likert scale. Those statements relate both to independent and dependent variables, so statistical analysis to find correlations is applied easily there. The results could be possibly generalized to the extent of all Russian SMEs. To do that we need to assume that our sample size is enough to be representative for the whole population.

2.3 Research Methods

Literature review showed the problem, that was not payed sufficient detail in Russian academic community, but there were some foreign researches that conducted that descriptive quantitative research using the sample in their home countries.

Research problem: *increase the understanding of KM in the context of SMEs in Russia and confirm a link between KM practices and organizational performance in SMEs in Russia.*

Research questions:

1) *Which types of KM processes and practices are more developed in Russia among SMEs?*
2) *How do KM practices correlate with organizational performance in Russia?*
3) *Which KM practices correlate in which way with organizational performance in SMEs in Russia?*

Based on the works of foreign colleagues the approach to study KM practices and processes and organizational performance was chosen. For KM practices and processes some researchers (Lee, Lan, 2009; Chan, Chao, 2008; Gold et al, 2001; Zaied, 2012; Alavi, Leidner, 2001) used the framework of Gold et al (2001), which represents the holistic approach to evaluating KM capabilities of a company. KM Infrastructure and KM Processes include every aspect from KM theory developed in academic circles (Yusof, Bakar, 2012) and it is one of a few, which combined all KM capabilities into one integrated framework (Khalifa, Schen, 2010). Other papers used only parts of this framework to assess KM capabilities of a company (Liao, Wu, 2009; Andreeva, Garanina, 2015; Andreeva, Kianto, 2012; Gharakhani, Mousakhani, 2012; Ha, Wo, 2015).

In this research paper we have decided to use the whole framework, to have general view on the current state of KM practices in Russian SMEs (first research question) and to identify more correlations and trends between KM and OP. The whole framework is similar to the recognized framework is developed by Desouza (2011), which is KP^2T, but is more relevant for empirical research. It includes two groups: Knowledge Infrastructure and Knowledge Processes: Culture, Structure, Technology and K. Acquisition, K. Conversion, K. Application and K. Protection. (the detailed description of both frameworks is in section 1.2.2). The questionnaire was once reworked after the pilot interview with the manager of one of the company-respondent.

Therefore, there are 7 indicators of KM practices in SMEs in our questionnaire. Each of them contains from 1 to 5 statements (or KM processes' attributes, total of 24), that companies' representatives had to evaluate on the Likert scale from 1 to 5, where 1 – totally disagree, 2 – somewhat agree, 3 – neither agree or disagree; 4 – somewhat agree, 5 – totally agree. The whole questionnaire can be found in Appendix 1.

F_1 – Knowledge acquisition capability

F_2 – Knowledge conversion capability

F_3 – Knowledge application capability

F_4 – Knowledge protection capability

F_5 – Organizational structure capability

F_6 – Organizational culture capability

F_7 – Technology capability

After each indicator is described in a sense of understanding current state of KM practices in Russian SMEs, Perkal method is then used to calculate the integrated indicator (latent variables) for each of those capabilities. Same method is used to calculate the general F indicator of KM that integrates all 7 of indicators.

$$F_i = \frac{1}{n}\sum_{j=1}^{n}(x_{i1} + x_{i2} + \cdots + x_{in})$$

Where:

F_i – integrated indicator of each of *i* KM capability

n – number of attributes in each of the indicators

x_{ij} – KM attributes in each of the indicators, evaluated in 5-points Likert scale

$$F = \frac{1}{7}\sum(F_1 + F_2 + F_3 + F_4 + F_5 + F_6 + F_7)$$

Where:

F – general integrated indicator of KM in a company

F_1, F_2, etc – integrated indicators of each of *i* KM capability

As we learned in section 1.4, there are several ways to evaluate organizational performance. In our case we have decided to use again the experience of researchers with similar work (Delaney et al., 1996; Liao, Wu, 2009; Voronov, 2014; Emden et al., 2005; Andreeva, Kianto, 2012). The different indicators of organizational performance were taken from those works, considered and reworked based on the similarities of the questions asked. In the end the four groups of questions were identified:

P_1 – Perceived organizational performance

P_2 – Objective measures of organizational performance

First factor is representing perceived organizational performance. In other words, it is how employees, managers and owners of the companies perceive the change in organizational performance comparing with their competitors. The respondents were offered to evaluate the change in their organization's performance (total 5 attributes) on each of the following dimensions from 1 to 5, where 1 – worst position comparing with competitors, 5 – best position comparing with competitors. The last factor is used to understand the actual change in organizational performance. Respondents had to evaluate the change in revenue, sales and market share in the last 3 years from 1 to 5, where 1 - negative change, 2- no change, 3- slightly increase, 4-medium increase, 5 - significant increase.

OP indicators (latent variables) were processed the same way as KM indicators, using Perkal method. It was used to calculate the integrated indicator for each of those capabilities. Same method is used to calculate the general F indicator of KM that integrates all 7 of indicators.

$$V_i = \frac{1}{n}\sum_{j=1}^{n}(y_{i1} + y_{i2} + \cdots + y_{in})$$

Where:

V_i – integrated indicator of each of *i* OP indicators

n – number of attributes in each of the indicators

y_{ij} – OP attributes in each of the indicators, evaluated in 5-points Likert scale

$$V = \frac{1}{4}\sum(V_1 + V_2 + V_3 + V_4)$$

Where:

V – general integrated indicator of OP of a company

V_1, V_2, etc – integrated indicators of each of *i* OP indicators

We want to understand how KM practices and processes influence on organizational performance, thus factors, representing KM practices and processes are independent variables, and factors, representing organizational performance are dependent variables. As we have seven factors of KM, we would like to see the influence of each factor on OP separately to offer better managerial implication of this research paper, because several researches identified that sometimes only one of the KM capabilities contribute to the organizational performance (Mills, 2010). Also, the it makes sense to see the correlation between integrated general indicator of KM and OP to have possibility to compare our results with the results of similar research conducted abroad.

Therefore, following hypotheses were derived from the desk analysis and work with the questionnaire.

H1: Knowledge acquisition processes have positive impact on organizational performance
H2: Knowledge conversion processes have positive impact on organizational performance
H3: Knowledge application processes have positive impact on organizational performance
H4: Knowledge protection processes have positive impact on organizational performance
H5: Organizational structure has positive impact on organizational performance
H6: Organizational culture has positive impact on organizational performance
H7: Technology capabilities has positive impact on organizational performance
H8: Integrated KM practices have positive impact on organizational performance

Besides the evaluation of 5-points Likert scale statements, respondents were also offered to answer general questions about their own profile (position and work experience at the company) and about profile of a company they are working in (type of business, geography of operations, company's age and size). Using this information, the respondent's profile can be described and probably, some correlations between this descriptive information and level of KM practices could be found. In the end, 2 questions were incorporated with the intention to see which actual tools from KM toolbox (Young, 2010; North, Babakhanlou, 2016) Russian SMEs use in their work. And the last question asked whether the respondent knew what KM is, and if yes, do they apply it in their work, or do they see it applied at their workplace.

2.3 Data

As was said before, the questionnaire is designed for managers, employees with different functional roles in the SMEs and owners of Russian SMEs. It was decided to collect data randomly from SMEs from all over Russia by posting the questionnaire online. The questionnaire was also sent directly to businessman and businesswomen known by the author with the wish to fill it out and send it to their relevant acquaintances. The other way of distribution of the survey was to post in in relevant communities in Telegram. This primary data was collected in the period of April 2018.

Similar researches aimed to see the dependence of organizational performance on KM practices used sample sizes of 327 (Liao, Wu, 2009), 104 (Voronov, 2014), 749 (Delaney, Huselid, 1996), 30 (Gharakhani, Mousakhani, 2012), 189 (Mills, 2010), 770 (Thawesaengskulthai and Chandrachai, 2012), 62 (Ubeda – Garcia, 2012), 13 (Kharabsheh, Magableh and Sawadha, 2012). Those researches were held generally with the help of academic research centers and distributed

their surveys through emails. As we see the number varies from 13 to 770 answers collected within one research, but as Mukhtar (2015) summarized in his literature review, all those research papers showed positive correlations between KM practices and Organizational Performance in their countries. Some of them showed weaker links between those two variables, some of them stronger, some correlations were insignificant, but it did not depend on the sample size.

2.4 Research plan

1) Desk analysis of KM practices and processes in SMEs, tools and methods of their evaluation
2) With the help of desk analysis prepare survey questions for evaluation of KM processes and practices and organizational performance
3) Launch a survey online and send it to target audience
4) Process the results in SPSS, identify trends and correlations
5) Summarize findings and discuss the results

2.5 Limitations of the research strategy

Offered research strategy can bring several limitations for the implications of this paper. First, the questionnaire consists of the elements that require subjective evaluation. As such all the questions about processes and practices in a company and about perceived organizational change may be inaccurately answered by the respondents.

Second, the size of the sample limits the possibilities to generalize the results of this work to the whole population of SMEs in Russia. It is also possible, that insufficient data could lead to the errors in statistical SEM analysis (Bentler and Yuan, 1999; Fan et al., 1999). To test this further research with the bigger data sample is needed.

Third, only cross-sectional data was collected, which means that some delayed effects of implementing KM practices potentially could not be registered by a company, if managers introduced KM not long ago.

Summary of Chapter II

Chapter II contains gives general information on the research philosophy (epistemology, ontology, axiology), research approach (inductive, deductive), research design (exploratory, conclusive, explanatory), methods (quantitative, qualitative). This overview laid ground to the research strategy of given research paper. It uses positivist assumptions in research philosophy by conducting deductive research with quantitative methods. First, exploratory literature analysis is conducted to understand the theory and find a research gap. There, research problem of linking knowledge management practices to organizational performance in Russian SMEs. From there 8

hypotheses are derived to test the correlation between 7 factors describing KM practices and processes and organizational performance.

The questionnaire was then designed using the experience of researchers from the same field, but other countries. This questionnaire consists of open-ended questions to collect the demographic data and close-ended questions to asses KM capabilities and organizational performance. Data sample was collected during April 2018, randomly sending the questionnaire to potential respondents through communities and personal contacts. Potential respondents are managers, owners and employees of small and medium businesses in Russia.

The data collected is meant to be verified for validity and reliability and then processed using SPSS and AMOS to answer approve or reject the hypothesis.

Chapter III. Empirical part

In this Chapter the empirical part is going to be conducted and discussed. First, we are going to describe the data collected and name the options for its processing, given the size and the quality of the sample. Then, the data is processed, the results are described and discussed with the following managerial implications and limitations listed.

3.1 Data collected

The data collected represents the sample of 41 SMEs. The respondents who took part in the survey are mostly (more than a half) middle level managers: managers of a department in a company or managers of one to several points of sales. 2 of the respondents are regular employees. Almost one third of the respondents are owners or CEOs of a company, which gives then the advantage of seeing the big picture of a company and give more exact data in the questionnaire. On the other hand, owners of the business tend to tell things more as they wish they were, but not as they really are, which is a limitation for this research. Most of the respondents works in a company 1 to 5 years, around 18% are working for 5 to 10 years for now and other 19% has work experience of more than 10 years in this company. Detailed information of respondents' demography could be found in following tables 4 and 5.

Resondent's position in a compay	**#**
Owner or CEO	13
Middle level manager	26
Regular employee	2

Resondent's work experience in this company	**#**
less than a year	6
1-2 years	11
3-5 years	11
5-10 years	6
more than 10 years	7

Table 4 and 5. The demography of respondents

Further, we would like to discuss the companies' profiles, which data we gathered for that research. Almost half of the companies are offering different kind of services, another 15% is represented by companies offering IT services. The retail companies represent 17% of our sample size, another 7% sells products in both retail and wholesale. The rest of the sample size is providing financial services, or both manufacturing and sales of the goods and services. The detailed information is reflected on the picture 8 below.

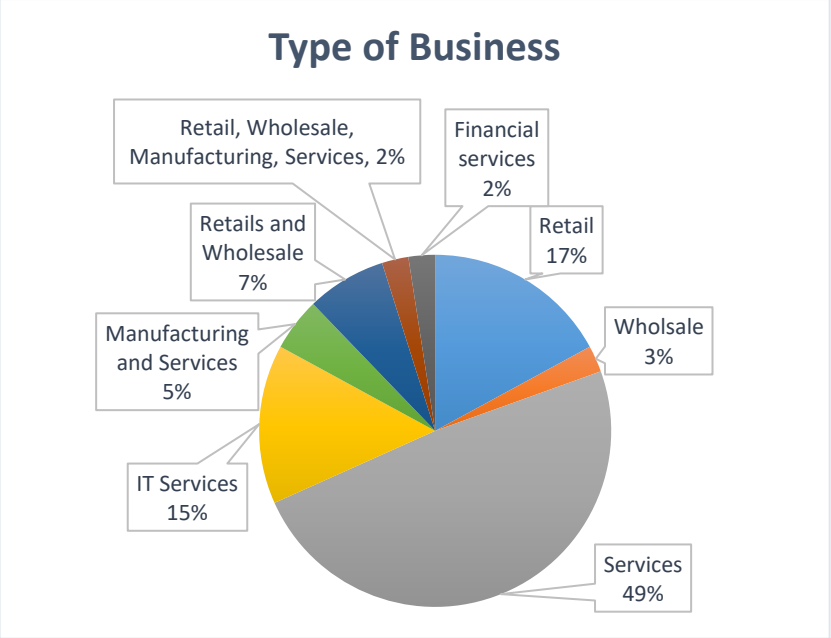
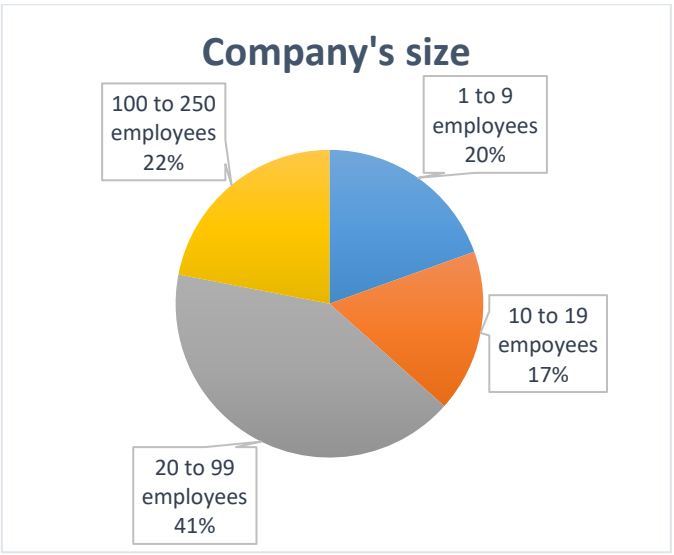


Fig.8 Companies' profile by type of business

The companies represented by our respondents are micro companies (1 to 9 employees) – 20%, extra-small companies (10 to 19 employees) – 17%, small companies (20 to 99 employees) – 41% and medium companies (100 to 250 employees) – 22%. The size of a company can also influence the KM practices in it generally because of the levels of management and organizational structure, but those attributes were measured in a questionnaire again, that is why it is possible to prove or disapprove the influence of formal structure on KM capabilities.

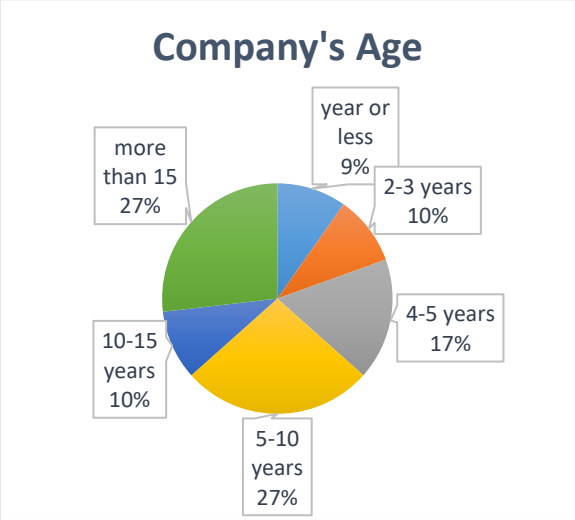


Size of a company by number of employees	#
1 to 9 employees	8
10 to 19 empoyees	7
20 to 99 employees	17
100 to 250 employees	9

Fig.9 Company's size by number of employees

The companies-respondents are of different age; therefore, they are on different stage of company's lifecycle. Almost two thirds of companies are quite mature, they are either 5-10 years

old, 10-15 years old, or even more than 15 years old. Other 15 companies are at the age of 1 to 5 years.



Company's Age	#
year or less	4
2-3 years	4
4-5 years	7
5-10 years	11
10-15 years	4
more than 15	11

Fig. 10 Company's Age

Finally, profile of the companies ends with the geography of operations. As was expected, most of the companies answered to the questionnaire are from Saint Petersburg or has Northwestern Federal District as an area of operations and distribution. Another 25% also operates in the center of Russia: Moscow and its region or Moscow, Saint-Petersburg and their regions. 10% of companies operates throughout all Russia and 15% has also export abroad in minimum two countries. One quarter of companies serves 1 or 2 non-central regions, mostly it is either Ural, or South of Russia. Therefore, the distribution of companies is following: whole Russia, whole Russia and export, central regions and Northwestern Federal District, and 1-2 non-central regions.

Fig.11 Company's selection by geography of operations

The next step in describing the data was to move closer to KM topic. First, in a questionnaire there was a question which checked the general awareness of KM concept, particularly, it asked if a respondent knows what KM is and if yes, is it applied in his/her company. As a result, we get that 27% does not know what KM is and 42% heard of it but does not know what does it mean. 31% left said that they know what KM is, and 7 people from them said that knowledge management practices and processes are applied in their companies and 6 people said that they do not see it in their companies.

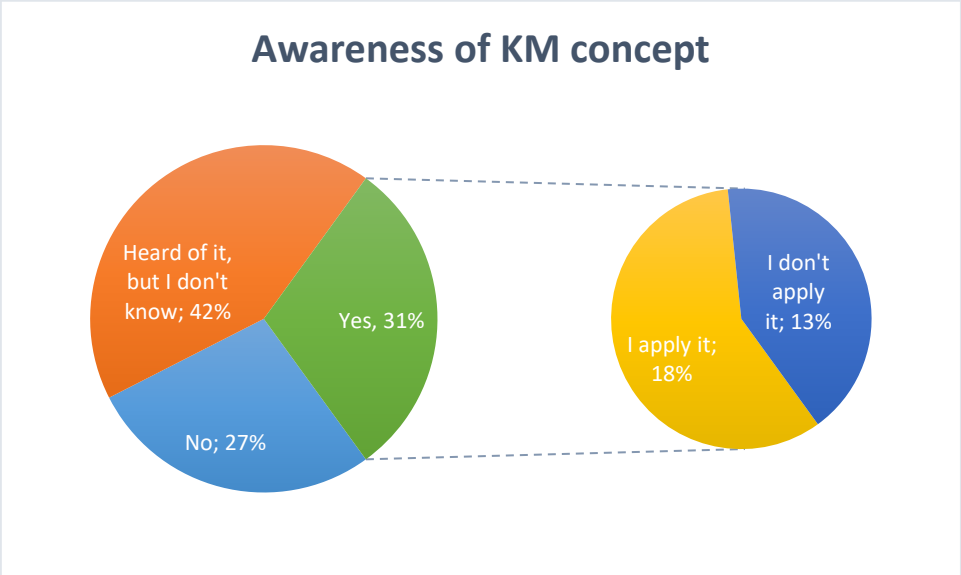


Fig.12 Awareness of KM concept

At the same time, multiple-choice question was offered in the questionnaire with the goal to understand which separate tools and technics from KM toolbox are used by the companies. It turned out that only one company does not use any of the KM tools that we offered for choice. The average number of tools used is 6. The variance starts from 1 (3 companies indicated that) to 12 (2 companies) tools used in a company's routines. The most frequent choice was Peer Assist, 2 times it was chosen as the only tool used. After-Action-Review and in a bundle with Lessons Learned and Virtual Collaborative Platform were the second most frequently used tool (27 out of 41 companies marked them). Document Libraries, Brainstorming, Knowledge Cafés and Communities of Practices were also chosen by more than a half of companies. Judging from that we say that Knowledge acquisition/creation and Knowledge Transfer should have high scores throughout our sample. Less times were chosen storytelling, Knowledge Portal, Idea contests and Exit interviews. The type of knowledge codification – Knowledge Mapping – was chosen only 4 times out of 41 companies-respondents.

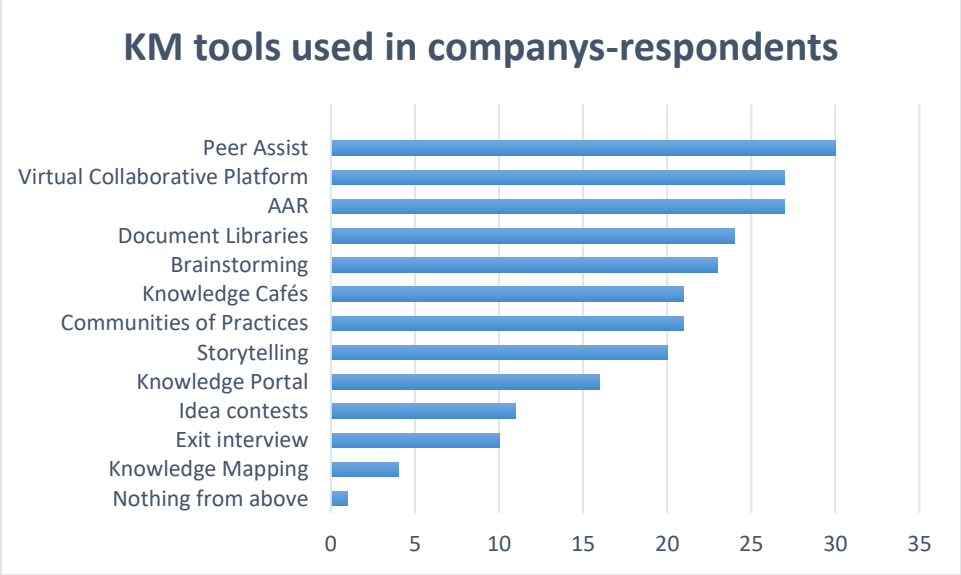


Fig.13 KM tools used in companies-respondents

After creating the profile of respondents, descriptive statistics were used to understand which KM practices are more developed in SMEs and which are less. To analyze Likert scale data, latent variables were created using Perkal method as was suggested in part 2.3. As we could see all indicators are showing the development of KM practices and processes above medium and the best indicator is Knowledge application, whilst the worst is Knowledge Acquisition.

KM Capabilities	**Mean**	**Median**
Knowledge Acquisition	3,63	3,75
Knowledge Conversion	3,70	3,67
Knowledge Application	4,01	4,00
Knowledge Protection	3,41	4,00
Knowledge Processes capabilities	*3,61*	*3,61*
Organizational Structure	3,87	4,00
Organizational Culture	3,85	4,00
Technology	3,70	3,67
Knowledge Infrastructure capabilities	*3,81*	*3,89*
Integrated KM indicator	**3,75**	**3,81**

Table 6. Descriptive statistics of integrated indicators of KM capabilities

Knowledge Acquisition. The results of the questionnaire revealed, that most of the companies gather feedback from their customers or clients with the hope to improve services and products based on those feedbacks. As this kind of external knowledge acquisition is quite developed in SMEs in Russia, acquiring knowledge from business partners and competitors have scored less on a Likert scale. And most of the companies showed indifference towards gathering best practices in the industry.

Knowledge Conversion. It was notices that the best score in this part was accounted to replacement of old knowledge with the new knowledge, but at the same it is said that this knowledge rarely is converted in this way that it can be implemented for developing products and services with it. Most of the companies slightly agreed that they are codifying and somehow distributing knowledge of individual employees to the whole organization, which correlates with organizational culture indicator showing that on average management of a company contributes to the free knowledge flow inside a company.

Knowledge Application. Those processes are more developed in Russian SMEs than others. The average score of application of lessons learned is higher than any other item in a questionnaire. Median for all thee items in this indicator showed that companies estimate their knowledge application processes positively having effect on their competitive and problems solving capabilities.

Knowledge Protection. This indicator revealed that SMEs do not care much about knowledge protection, although the average score is slightly above "indifferent" point. This correlates with the fact, that SMEs mostly manage tacit knowledge than explicit and knowledge loss is not a problem for them, because every employee is replaceable with other (Desouza, Awazy, 2006).

Organizational Structure. Back to the point with tacit knowledge prevailing in SMEs, companies agreed that organizational structure of a company in general contributes to the free knowledge flow in a company. Less scores were attributed to the assumption, that the structure is built the way that employees can take decisions independently and that they are contributing in decisions about company's future. The question about employee responsible for strategic knowledge management has scored less points on Likert scale, which proves, that companies-respondents just use composite elements of KM, but not the holistic approach to it.

Organizational Culture. The overall score for organizational culture capabilities indicator is high, but there are some gaps between the variables. It was noted, that SME's managers improve their knowledge, share their knowledge and value employees' opinions on different matters. On the other hand, it is usually not explicitly said in the companies that the knowledge is needed to be

accumulated, created, converted or shared. As well as the score for managers motivating employees doubt existing knowledge, which lead to the thought that knowledge acquisition and knowledge conversion overall scores are also lower than other knowledge capabilities and this has causal relationship.

Technology. Technology scores in SMEs reveals that they do not use technologies to the full potential. SMEs are said (Desouza, Awazy, 2006) to be more human-oriented, than technology oriented and mostly the information flows through personal contacts. Technologies are used on the basic level as messengers, search engines with internet access or analytical tool.

Also, cluster analysis can be applied here to sort out companies by the level of KM development and see if there are correlations with any of demographic data. Using K-means cluster analysis we can predetermine number of clusters and see which type of companies has more developed KM practices (mean = 4.20, above average) and which type has less developed KM practices (mean – 2.96, below average). An output for the analysis can be seen in Appendix 2.1. It shows that none of the demographic factors (type of business, size, age) does not correlate properly with the level of KM practices development. We take it as a sign that the data does not contain any bias because most of the respondents are from central part of Russia or because almost a half of them are service companies. This conclusion suggests that the data is homogeneous and can be used for correlation analysis.

3.2 Hypothesis Testing and Results Discussion

To proceed with checking the hypothesis, number of steps was taken. First, exploratory factor analysis was performed to check our data for reliability and adequacy to reduce all our variables to latent variables, also known as integrated indicators. In the beginning we need to check the reliability and validity of the measurement of scales with the Cronbach's Alpha test based on inter-item correlation (Hurley et al., 1997). According to Hair et al. (1998), Cronbach's Alpha for internal consistency of variables and validity of scale should exceed 0.6. The test resulted in α> for almost all our latent variables: knowledge acquisition capabilities, knowledge conversion capabilities, organizational structure capabilities, organizational culture capabilities, technology capabilities, perceived organizational performance and financial performance. Organizational structure capabilities showed unsatisfactory alpha, that is why it was decided to delete one item from this scale. This item had negative covariance and after its deletion, alpha went up to be reliable. The variable knowledge protection capabilities are not possible to be tested because the measurement scale consists only of one item. Therefore, the reliability and validity of scale is confirmed and all measurements in the questionnaire are useful for the research and that our latent variables could be used in further analysis instead of initial items. (see Appendix 2).

Latent Variable	**Cronbach's Alpha**
Knowledge acquisition capabilities	0,750
Knowledge conversion capabilities	0,739
Knowledge application capabilities	0,814
Knowledge protection capabilities	-
Organizational Structure capabilities	0,670
Organizational Culture capabilities	0,815
Technology capabilities	0,872
Integrated KM indicator	0,873
Perceived Organizational Performance	0,811
Financial Performance	0,909

Table 7. Test for reliability of scale

KMO and Bartlett's test was then applied to check the adequacy of data for running factor analysis. KMO = 0.634 is more than 0.5 and Bartlett's test of sphericity is significant ($p = 0.000 < 0.05$) shows that correlation matrix is not an identity matrix and the factor analysis can be run. The communalities, which show the proportion of each variable's variance that can be explained by the factors (our latent variables), are greater than 0.4 (Appendix 2).

Second, the descriptive statistics was obtained in order to see the correlations between KM variables and OP variables (Appendix 2). Table 8 shows the correlations significant at the level 0.01(**) or 0.05(*). All knowledge process capabilities show significant positive correlation with Perceived organizational performance and Financial Performance except Knowledge protection, which correlation with Financial Performance is not significant on any level. In infrastructure capabilities, the greatest correlation shows technology with both performance indicators and less correlation shows organizational structure. Organizational Culture capabilities does not share significant covariance, so its correlation with performance indicators we can not take into account on this level. In general correlation matrix gives positive answer on whether it is possible to test deducted hypothesis or not.

Variables	1	2	3	4	5	6	7	8
1. Knowledge acquisition capabilities								
2. Knowledge conversion capabilities	,759**							
3. Knowledge application capabilities	,685**	,773**						
4. Knowledge protection capabilities	,425**	,417**	,542**					
5. Organizational Structure capabilities	,335*	,247	,296	-,076				
6. Organizational Culture capabilities	,746**	,756**	,760**	,351*	,463**			
7. Technology capabilities	,788**	,692**	,638**	,514**	,409**	,637**		
8. Perceived organizational performance	,700**	,585**	,606**	,517**	,208	,532**	,651**	
9. Financial Performance	,489**	,434**	,421**	,285	,239	,447**	,501**	,597**

Table 8. Correlation matrix[1]

Third, the Structural Equation Modelling (SEM) were chosen to test the hypothesis (Liao, Wu, 2009; Andreeva, Kianto, 2011) using Integrated KM Practices as mediator variable and looking at how the model works as a whole. This analysis allows to check the structural relationship between measured variables and latent constructs. Being the combination of factor analysis and multiple regression analysis, it estimates multiple and interrelated dependence in a single analysis. In this analysis we are allowed to construct our own model with some variables being mediators and see the influence of multiple factors on dependent variable.

Integrating our hypothesis into a model for SEM, we are getting the model to check shown on figure 14. The results of the analysis showed that the model as a whole is significant, and we can take further estimates of our hypothesis. Only one hypotheses – H6: Organizational Culture correlate positively with organizational performance – showed insufficient significance on the 95% confidence interval. Other hypothesis proven to be significant and they show overall positive correlation with organizational performance.

1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

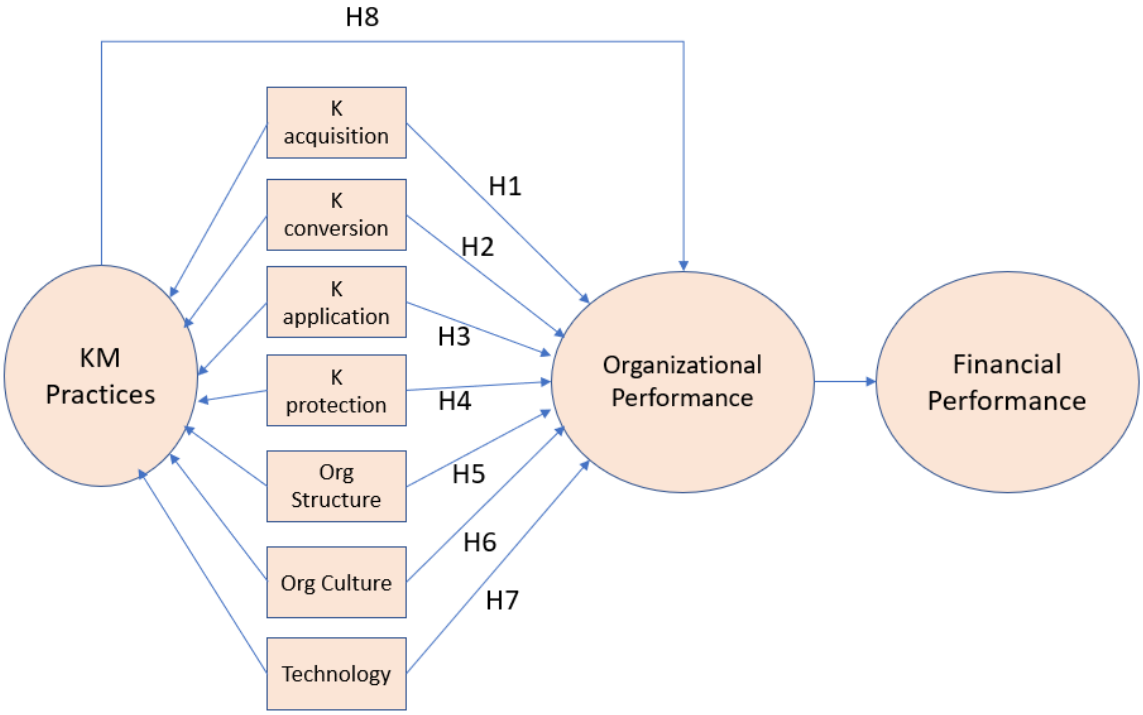


Fig. 14 Model for Structural Equation Modelling

Integrated KM indicator showed the impact coefficient of 0.729 on the perceived organizational performance. Other factors separately from KM integrated indicator showed also significance on the 95% confidence interval. The highest impact coefficient, more than 1 times, was shown by Knowledge acquisition, Knowledge conversion and Knowledge application processes. The weakest impact coefficient was shown by Knowledge protection processes and Organizational structure capabilities. Moderate impact is between Technology capabilities and Organizational Performance. In the model we added another observable variable - Financial Performance - that was measured objectively. Therefore, we also checked the influence of Perceived Organizational Performance (quality of the products, customer satisfaction, development of new products, ability to attract and retain essential employees) on the Objective Financial Performance (change in market share, revenues and sales for the last 3 years). This influence was identified to be moderate and significant as well.

Overall, only hypothesis 5 - organizational structure has positive impact on organizational performance – did not prove itself right. All other hypotheses have been proven to be statistically significantly true, thus KM processes and practices are contributing to the company's organizational performance.

Hypothesis	Estimate	Significance
Model fit		,000
H1: Knowledge acquisition processes have positive impact on organizational performance	1,315	,010
H2: Knowledge conversion processes have positive impact on organizational performance	1,189	,033
H3: Knowledge application processes have positive impact on organizational performance	1,975	,025
H4: Knowledge protection processes have positive impact on organizational performance	,224	,021
H5: Organizational structure has positive impact on performance	,825	,107
H6: Organizational culture has positive impact on organizational performance	,351	,047
H7: Technology capabilities has positive impact on organizational performance	,623	,034
H8: Integrated KM practices have positive impact on organizational performance	**,729**	**,000**
Additional: Perceived Organizational Performance has positive impact on Objective Financial Performance	*,863*	*,000*

Table 9. Results of SEM analysis. Coefficients for regression and significance.

The main general indicator of KM practices in the companies showed the estimated of 0,729 in the regression model with organizational performance being dependent variable. It means that when KM indicator increases by 1 point, Organizational Performance indicator increases by 0.729 points, which is a significant linear dependency. To remember the latter indicator consisted of quality of services and goods, development of new products, ability to attract and retain essencial employees and clients' satisfaction. Therefore,

H8: Integrated KM practices have positive impact on organizational performance

The following hypotheses have proven to be true as well and they are composite parts of general KM indicator. Those hypotheses have bigger regression estimates than general indicator itself, which means that they will contribute significantly to company's organizational performance, even

if not all of KM processes and practices are included in company's business processes. Thus, they are the first KM processes recommended to invest to in SMEs in Russia.

H3: Knowledge application processes have positive impact on organizational performance

H1: Knowledge acquisition processes have positive impact on organizational performance in Russian SMEs

H2: Knowledge conversion processes have positive impact on organizational performance

Next hypotheses are also proven to be statistically significantly true. Those KM indicators contributes much less to the organizational performance with the estimates from 0,224 to 0,623. If we return to the literature review, those capabilities are infrastructural or supportive, so they are as well essential to a company, because they play a role of compliments, without which it would be impossible to support mentioned previously KM processes in a long-term perspective.

H7: Technology capabilities has positive impact on organizational performance

H6: Organizational culture has positive impact on organizational performance

H4: Knowledge protection processes have positive impact on organizational performance

And one hypothesis was not statistically significantly proven and needs more of explanatory analysis to understand why Organizational structure fit for KM in SMEs in Russia does not contribute to organizational performance.

H5: Organizational structure has positive impact on organizational performance

3.3. Suggestions for Further Research

This work has a potential to be continued with collecting more responses to the questionnaire and doing cluster analysis again in order to identify causal relations between the types of SMEs (service, retail, manufacturing etc.) or age of a company and level of KM capabilities in a company. The research with bigger sample size will lead to more precise regression analysis as well.

In-depth interviews on the topic of KM with SMEs is also a way to continue this research and to explain the correlations or non-correlations between KM practices and organizational performance in Russian SMEs. It will also help to understand better why one or another KM practices are more developed in Russia among SMEs and give context to the use of certain KM tools.

Summary of Chapter 3.

Chapter 3 is devoted wholly to the empirical research of this work. Firstly, it discusses the obtained data sample, 41 responses from Russian SMEs, particularly company-respondent's profile. The companies who filled out the questionnaire could be divided by type of the business they are in, by the size or age and geography of operations. The Knowledge processes capabilities and Knowledge Infrastructure capabilities assessed were on average assessed as above medium (more than 3 on 5-point Likert scale), which showed that in inexplicit way companies do use some KM processes and practices in their business routine, but they are not the result of comprehensive KM strategy. The quantitative analysis started with descriptive statistics and correlation matrix showed that organizational performance and KM processed and KM Infrastructure capabilities do have statistically significant positive correlation, which means that there is somewhat of relation between those variables. The only capability, which did not show significant correlation was organizational structure and same proved regression model run as structural equation model. The model did prove right hypotheses 1,2,3,4,6,7 and 8, which means that KM practices, including knowledge acquisition processes, knowledge conversion processes, knowledge application processes, knowledge protection processes and relevant for KM organizational culture and technologies do have positive impact on organizational performance, which in its turn, makes positive impact on financial performance. Those results are invoking to put more thoughts into motivating SMEs in Russia to adopt partially or wholly KM strategies, tools and techniques for better competitive advantages. Certain limitations of this work give the idea for future research in this direction with bigger sample size and in-depth interviews to explain the causal relationships between KM and Organizational Performance.

Conclusion

Since Knowledge Management (KM) has been established as a field of study in 1990s, it was a highly discussed topic among academics and practitioners of management. It has been said that KM brings several benefits to a firm's business processes, including faster decision-making through quick knowledge search, increasing efficiency and productivity by reducing the cases of "reinventing the wheel", improving innovation through successful internal and external collaboration etc. (Omotayo, 2015). KM includes different types of tools, practices and processes and even if a company does not have a separate KM strategy, it still somehow manages knowledge (Desouza, 2011).

In Russia a lot of attention towards KM is paid by large organizations, therefore, academics, in the first place, started to study those companies. At the same time, SMEs are started to be recognized as drivers of economy in Russia and other countries, although the so called "mortal rate" of small enterprises is high and companies need to find new innovative ways to stay competitive in a globalized markets. One of those ways could be KM.

Foreign researches started to investigate the problem of KM and SMEs in 2010s. Since then, there were a lot of surveys launched abroad, which then were used to see how SMEs use KM and which kind of influence does it have on organizational performance. In that sense, Russian academic world lags behind and still focuses on large corporations or more narrow topics, such as KM and HR, KM and innovativeness, KM and learning.

Therefore, **research problem** is following: increase the understanding of KM in the context of SMEs in Russia and confirm a link between KM practices and organizational performance in SMEs in Russia.

Research questions:

Which types of KM processes and practices are more developed in Russia among SMEs?

How do KM practices correlate with organizational performance in Russia?

Which KM practices correlate in which way with organizational performance in SMEs in Russia?

To answer those questions a thorough deck analysis was conducted, and relevant methodology was chosen. First, it was decided to use quantitative methods and make statistical model with KM as independent variable and organizational performance as depended variable. The common used framework (Gold et al., 2001) was discovered and used to formulate the hypotheses and construct questionnaire with 5-point Likert scale. The questionnaire included 9 sections, each containing suggestions that respondent had to agree or disagree with. Sections are

the following: Knowledge acquisition processes, Knowledge conversion processes, Knowledge application processes, Knowledge protection processes, Organizational Structure, Organizational Culture, Technology, Perceived organizational performance and Objective financial performance. The hypotheses are as following:

H1: Knowledge acquisition processes have positive impact on organizational performance

H2: Knowledge conversion processes have positive impact on organizational performance

H3: Knowledge application processes have positive impact on organizational performance

H4: Knowledge protection processes have positive impact on organizational performance

H5: Organizational structure has positive impact on organizational performance

H6: Organizational culture has positive impact on organizational performance

H7: Technology capabilities has positive impact on organizational performance

H8: Integrated KM practices have positive impact on organizational performance

41 responses were collected from owners, managers and employees of Russian SMEs. Descriptive statistics showed that in general, there is a 30% awareness of KM and 18% of the companies said that they use KM tools in their business routine. On average KM indicators showed above medium scores, which means that Russian SMEs do use KM practices and processes in their everyday work and it can serve as a ground for adopting more comprehensive KM strategies. The most developed processes are Knowledge Application, as well as Organizational Structure and Culture are shown to be of a fit for KM processes.

Following, the correlation analysis showed that there is positive relation between KM indicators and Organizational performance indicators and that those indicators are interdependent. Only Organizational Structure capability does not have statistically significant linear dependency with organizational performance, which is also proven by regression analysis run through structural equation modelling. This model showed that effect of structure on performance is not statistically significant, whereas other KM indicators revealed to have positive impact on organizational performance and, therefore, proved hypothesis 1,2,3,4,6,7,8 to be true. The biggest impact coefficient was attributed to Knowledge application, acquisition and conversion processes. Knowledge protection capabilities and organizational culture had the smallest coefficients of impact on organizational performance of Russian SMEs.

Although, there is a limitation of small sample size, those results give ground to consider the broader implementation of KM practices and processes by Russian SMEs and use KM as a source of additional competitive advantage. Further research may include in-depth interviews to explain causal relationship of KM tools, processes and practices used in SMEs in Russia and the results of their performance.

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Appendix 1. Questionnaire

Classification questions

1. What is the type of the company you are working at? (several choices are possible)
    a. Retail
    b. Service
    c. Manufacturing
    d. IT
    e. Wholesaler
    f. Banking
    g. Other
2. How many employees does your company have?
    a. 1-9 (micro)
    b. 11-19 (extra small)
    c. 20-99 (small)
    d. 100-249 (medium)
    e. 250+ (large)
3. How old is your company?
    a. Year of less
    b. 2-3 years
    c. 4-5 years
    d. 5-10 years
    e. 10-15 years
    f. More than 15 years

4. Which region are you operating in?
5. What is your position in the company (several choices is possible)
    a. Owner
    b. General director
    c. Manager of one or several business units (departments)
    d. Regular employee without managerial functions
6. How long are you working at this company?

Target questions: KM awareness

1. Do you know what Knowledge Management is?
    a. Yes
    b. No
    c. I have heard these words, but I do not know do they mean
2. If you know what is Knowledge Management, do you or your managers/co-workers apply it in your company's business processes?
    a. Yes
    b. No
3. Do you or your managers/co-workers apply any of the following tools in your company's routine? Check those, which are used.
    a. Communities of Practices
    b. Peer Assist
    c. Virtual Collaborative Platform
    d. After-Action-Review
    e. Document Libraries
    f. Brainstorming
    g. Knowledge Cafés
    h. Storytelling
    i. Knowledge Portal
    j. Idea contests
    k. Exit Interview
    l. Knowledge Mapping
    m. None of the above

Target questions: KM capabilities – Likert scale questions

Indicator	**Attributes**	**Признаки**
Please, read following sentences and rate each sentence from 1 to 5, where 1 - totally disagree, 2-somewhat agree, 3- neither agree nor disagree, 4 - somewhat agree, 5 - totally agree *В данном разделе Вам будет предложено прочитать высказывания, относящиеся к процессам и практикам в Вашей компании. Каждому высказыванию нужно поставить от 1 до 5 баллов, где 1 - я НЕ согласен с данным высказывание; 2 - я скорее не согласен, чем согласен с данным высказыванием; 3 - я нейтрально отношусь к данному высказыванию; 4 - я скорее согласен, чем не согласен с данным высказыванием; 5 - я полностью согласен с данным высказыванием*		
Knowledge acquisition	Our company: 1. Use feedback from projects to improve subsequent projects 2. Has processes for exchanging knowledge with our business partners 3. Has process for benchmarking performance 4. Has teams devoted to identifying best practice	1. Наша компания использует обратную связь, чтобы в будущем улучшить работу 2. В нашей компании есть процессы обмена знаниями с нашими бизнес-партнерами 3. В нашей компании есть процессы бенчмаркинга (сравнение компетенций, практик и результатов компании с конкурентами) 4. В нашей компании есть люди, которые занимаются поиском лучших практик по индустрии
Knowledge conversion	1. Has processes for converting knowledge into the design of new product/service. 2. Has processes for absorbing knowledge form individuals into the organization 3. Has processes for replacing outdated knowledge.	1. В нашей компании есть процессы конвертирующие знания в дизайн новых продуктов или услуг 2. В нашей компании есть процессы трансформации индивидуальных знаний сотрудников в организационные знания 3. В нашей компании есть процессы замены устаревшей информации на новую
Knowledge application	1. Has processes for applying knowledge learned from mistakes or experiences.	1. В нашей компании есть процессы применения знаний, полученных из опыта и ошибок

	2. Has processes for using knowledge to solve new problems. 3. Is able to locate and apply knowledge to changing competitive conditions. 4. Quickly links sources of knowledge in solving problems.	2. В нашей компании есть процессы использования знаний для решения новых проблем 3. Наша компания способна определить и применить необходимые знания в меняющихся условиях конкуренции 4. Наша компания способна быстро находить источники знаний для решения проблем
Knowledge protection	1. Strategic knowledge is protected so that people who are not allowed to see it, could not access it.	1. Стратегические знания защищены таким образом, что у тех, кому не разрешено видеть информацию, нет к ней доступа
Organizational structure	1. Company contributes to informal communication among employees 2. The responsibilities are distributed that way that employees could make independent decision. 3. Employees have possibilities to participate in decision-making in a company 4. A company defines one employee who is responsible for strategic knowledge management	1. Структура компании способствует неформальному взаимодействию между сотрудниками организации 2. В компании рабочие обязанности определены таким образом, что сотрудники могут независимо принимать решения 3. Сотрудники имеют возможность участвовать в принятии решений в компании 4. В компании четко определен сотрудник,который отвечает за стратегическое управление знаниями
Organizational culture	1. Management strategy of knowledge and competences is reaching employees clearly and fully 2. Managers of our company always improve their knowledge 3. Managers of our company share knowledge in an open and equal manner 4. Managers of our company appreciate ideas and opinions of employees	1. Стратегия управления знаниями и компетенциями компании ясно и полно доносится до работников 2. Руководители нашей компании постоянно совершенствуют свои знания 3. Руководители нашей компании делятся знаниями в открытой и равноправной манере 4. Руководители нашей компании ценят идеи и точки зрения работников и принимают их во внимание

	5. Managers of our company encourage employees to doubt existing knowledge	5. Руководители нашей компании поощряют работников сомневаться в существующих знаниях
Technology	A company uses technologies for: 1. Development of a new products and services in collaboration with outside partners 2. Collect business-related knowledge, for example, about competitors, customers, external environment 3. Analysis of knowledge in order to make decisions more effectively	Компания использует информационные технологии для: 1. Разработки новых продуктов и услуг совместно с внешними заинтересованными лицами 2. Сбора знаний, касающихся бизнеса, например, относительно конкурентов, потребителей и внешней среды в целом 3. Анализа знаний с целью принятия более эффективных решений

Organizational Performance – Likert scale questions

Indicator	**Attributes**	**Признаки**
Please, rate your organization's performance relative to that of your competitors on each of the following dimensions: *from 1 to 5, where 1 - the lowest score, 5 - the highest score* *Пожалуйста, оцените результаты деятельности Вашей компании по сравнению с конкурентами по следующим критериям:* *от 1 до 5, где 1 - наименьший балл, 5 - самый высокий балл*		
Perceived organizational performance	1. Quality of products or services or programs 2. Developments of new products or services or programs 3. Ability to attract essential employees 4. Ability to retain essential employees 5. Satisfaction of customers or clients	1. Качество товаров (услуг, программ) 2. Разработка новых товаров (услуг, программ) 3. Способность привлекать необходимых сотрудников 4. Способность удерживать необходимых сотрудников 5. Удовлетворение клиентов

Please, evaluate the change in your organization's performance in the last 3 years on each of the following dimensions: *from 1 to 5, where 1 - negative change, 2- no change, 3- slightly increase, 4-medium increase, 5 - significant increase* *Пожалуйста, оцените изменения в результатах деятельности Вашей компании за последние 3 года по следующим показателям:* *от 1 до 5, где 1 - отрицательное изменение, 2-нет изменения, 3-небольшое положительное изменение, 4-среднее положительное изменение, 5-значительное положительное изменение*		
Objective measures of organizational performance	1. Change of organization's revenue for the last 3 years 2. Change in sales of goods or services for the last 3 years 3. Change of organization's market share for the last 3 years	1. Изменение в доходов организации за последние 3 года 2. Изменение объема проданных товаров или услуг за последние 3 года 3. Изменение доли рынка за последние 3 года

Appendix 2. Excel, SPSS and AMOS Output

2.1 Cluster (K-means) Analysis

Final Cluster Centers

	Cluster	
	1	2
Knowledge Management Indicator	4,20	2,96

Number of Cases in each Cluster

Cluster	1	26,000
	2	15,000
Valid		41,000
Missing		,000

No	Type of Business	Number of Employees	Age of a Company	Region of Operations	KM Awareness	Number of KM tools used	Cluster
1	Service	20-99	4-5	Saint-Petersburg, LO	I know	2,00	1
2	Service	20-99	more than 15	Saint-Petersburg, LO	I know	1,00	1
3	Service	1- 9	less than 1	Saint-Petersburg, LO	I heard, but I don't know	9,00	1
4	Service	10-19	more than 15	Moscow, MO	I know	11,00	1
6	Service	20-99	5-10	World	I don't know	5,00	1
7	Retail	20-99	5-10	Moscow, MO	I don't know	9,00	1
8	Retail	20-99	5-10	Moscow, MO	I don't know	3,00	1
9	IT	1- 9	5-10	Moscow, MO	I heard, but I don't know	6,00	1
10	Service	20-99	more than 15	1 region	I don't know	6,00	1
12	Retail	20-99	5-10	World	I know	12,00	1
13	Service	1- 9	2-3	1 region	I don't know	4,00	1
14	Retail, Wholesale, Service, Manufacturing	100 - 250	10-15	2 regions	I heard, but I don't know	12,00	1
15	Retail	20-99	5-10	Moscow, MO	I heard, but I don't know	8,00	1
17	Service	10-19	2-3	1 region	I heard, but I don't know	6,00	1
18	Retail, Wholesale	10-19	4-5	Moscow, MO	I heard, but I don't know	3,00	1
21	Retail	20-99	more than 15	1 region	I know	7,00	1
23	Service	10-19	2-3	Saint-Petersburg, LO	I heard, but I don't know	4,00	1

26	Service	100 - 250	more than 15	1 region	I heard, but I don't know	6,00	1
27	IT	10-19	2-3	World	I know	9,00	1
28	Service, Manufacturing	100 - 250	5-10	1 region	I don't know	11,00	1
29	IT	20-99	4-5	2 regions	I know	7,00	1
35	IT	100 - 250	5-10	Russia	I heard, but I don't know	6,00	1
36	Service, Manufacturing	100 - 250	4-5	Moscow, MO, Saint-Petesburg, LO	I know	9,00	1
37	Service	20-99	10-15	Moscow, MO, Saint-Petesburg, LO	I heard, but I don't know	9,00	1
38	Service	1- 9	less than 1	Saint-Petersburg, LO	I know	3,00	1
39	Service	1- 9	4-5	Northwest Federal District	I don't know	6,00	1
5	Service	1- 9	10-15	Saint-Petersburg, LO	I know	3,00	2
11	Service	10-19	4-5	Saint-Petersburg, LO	I don't know	3,00	2
16	Service	1- 9	10-15	Moscow, MO, Saint-Petesburg, LO	I know	2,00	2
19	IT	20-99	less than 1	Russia	I heard, but I don't know	8,00	2
20	Retail	20-99	more than 15	1 region	I don't know	,00	2
22	Service	10-19	more than 15	Northwest Federal District	I heard, but I don't know	1,00	2
24	IT	20-99	5-10	Saint-Petersburg, LO	I heard, but I don't know	1,00	2
25	Service	20-99	4-5	Russia	I heard, but I don't know	6,00	2
30	Investments	1- 9	less than 1	Northwest Federal District	I don't know	7,00	2
31	Service	20-99	5-10	World	I know	3,00	2
32	Retail, Wholesale	100 - 250	more than 15	World	I heard, but I don't know	6,00	2
33	Wholesale	100 - 250	more than 15	1 region	I heard, but I don't know	3,00	2
34	Service	20-99	5-10	Moscow, MO, Saint-Petesburg, LO	I don't know	7,00	2
40	Retail, Wholesale	100 - 250	more than 15	Russia	I heard, but I don't know	7,00	2
41	Retail	100 - 250	more than 15	World	I know	3,00	2

2.2. Exploratory Factor Analysis

2.2.1 Scale Reliability Analysis. Cronbach's alpha

1. Knowledge acquisition capabilities

Reliability Statistics

Cronbach's Alpha	N of Items
,750	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Our company use feedback from projects to improve subsequent projects	10,3659	11,288	,418	,759
Our company has processes for exchanging knowledge with our business partners	10,7805	10,876	,551	,693
Our company has process for benchmarking performance	11,0976	9,790	,596	,664
Our company has teams devoted to identifying best practice	11,2927	8,762	,635	,639

2. Knowledge conversion capabilities

Reliability Statistics

Cronbach's Alpha	N of Items
,739	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted

Our company has processes for converting knowledge into the design of new product/service.	7,6341	4,538	,451	,796
Our company has processes for absorbing knowledge form individuals into the organization	7,3902	4,794	,545	,676
Our company has processes for replacing outdated knowledge.	7,1707	3,995	,719	,465

3. Knowledge application capabilities

Reliability Statistics

Cronbach's Alpha	N of Items
,814	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Our company has processes for applying knowledge learned from mistakes or experiences.	7,7805	3,226	,726	,682
Our company has processes for using knowledge to solve new problems.	8,2439	3,139	,653	,765
Our company is able to locate and apply knowledge to changing competitive conditions.	8,0244	3,724	,628	,784

4. Organizational Structure capabilities

Reliability Statistics

Cronbach's Alpha	N of Items
,255	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Company contributes to informal communication among employees	11,0976	4,990	,326	-,020[a]
The responsibilities are distributed that way that employees could make independent decision.	11,9756	4,274	,315	-,077[a]
Employees have possibilities to participate in decision-making in a company	11,5610	5,102	,290	,021
A company defines one employee who is responsible for strategic knowledge management	11,8293	6,995	-,209	,670

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

5. Organizational Culture capabilities

Reliability Statistics

Cronbach's Alpha	N of Items
,815	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Management strategy of knowledge and competences is reaching employees clearly and fully	15,8780	13,060	,531	,812
Managers of our company always improve their knowledge	15,1707	12,895	,785	,725

Managers of our company share knowledge in an open and equal manner	15,1951	12,961	,725	,742
Managers of our company appreciate ideas and opinions of employees	15,0732	15,570	,566	,794
Managers of our company encourage employees to doubt existing knowledge	15,6585	14,780	,482	,815

6. Technology capabilities

Reliability Statistics

Cronbach's Alpha	N of Items
,872	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
A company uses technologies for development of a new products and services in collaboration with outside partners	7,4390	5,752	,685	,885
A company uses technologies for collecting business-related knowledge, for example, about competitors, customers, external environment	7,4390	5,152	,820	,756
A company uses technologies for analysis of knowledge in order to make decisions more effectively	7,3171	6,322	,776	,810

7. Perceived Organizational Performance

Reliability Statistics

Cronbach's Alpha	N of Items
,811	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Quality of products or services or programs	15,1951	12,111	,680	,753
Developments of new products or services or programs	15,3902	11,894	,501	,811
Ability to attract essential employees	15,5122	11,206	,623	,768
Ability to retain essential employees	15,4390	11,902	,615	,770
Satisfaction of customers or clients	15,2439	13,239	,640	,772

8. Financial Performance

Reliability Statistics

Cronbach's Alpha	N of Items
,909	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Change of organization's revenue for the last 3 years	7,3902	5,544	,866	,829
Change in sales of goods or services for the last 3 years	7,3171	5,222	,801	,889
Change of organization's market share for the last 3 years	7,7317	6,001	,795	,888

9. Integrated KM Indicator

Reliability Statistics

Cronbach's Alpha	N of Items
,873	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Knowledge acquisition capabilities	22,6126	22,794	,813	,834
Knowledge conversion capabilities	22,5415	23,278	,785	,838
Knowledge protection capabilities	22,2325	24,032	,810	,839
Knowledge protection capabilities	22,8260	23,003	,453	,900
Organizational Structure capabilities	22,2980	28,118	,307	,892
Organizational Culture capabilities	22,3919	23,929	,788	,840
Technology capabilities	22,5415	21,683	,808	,832

2.3 Confirmatory Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,634
Bartlett's Test of Sphericity	Approx. Chi-Square	1110,085
	df	465
	Sig.	,000

Communalities[a]

	Initial	Extraction
Our company use feedback from projects to improve subsequent projects	,929	,995
Our company has processes for exchanging knowledge with our business partners	,937	,999
Our company has process for benchmarking performance	,865	,945
Our company has teams devoted to identifying best practice	,898	,952
Our company has processes for converting knowledge into the design of new product/service.	,906	,962
Our company has processes for absorbing knowledge form individuals into the organization	,938	,996

Our company has processes for replacing outdated knowledge.	,920	,963
Our company has processes for applying knowledge learned from mistakes or experiences.	,913	,998
Our company has processes for using knowledge to solve new problems.	,941	,995
Our company is able to locate and apply knowledge to changing competitive conditions.	,943	,997
Strategic knowledge is protected so that people who are not allowed to see it, could not access it.	,901	,946
Company contributes to informal communication among employees	,838	,985
The responsibilities are distributed that way that employees could make independent decision.	,858	,929
Employees have possibilities to participate in decision-making in a company	,875	,943
A company defines one employee who is responsible for strategic knowledge management	,856	,993
Management strategy of knowledge and competences is reaching employees clearly and fully	,905	,951
Managers of our company always improve their knowledge	,945	,975
Managers of our company share knowledge in an open and equal manner	,905	,953
Managers of our company appreciate ideas and opinions of employees	,922	,992
Managers of our company encourage employees to doubt existing knowledge	,904	,987
A company uses technologies for development of a new products and services in collaboration with outside partners	,917	,996
A company uses technologies for collecting business-related knowledge, for example, about competitors, customers, external environment	,937	,989
A company uses technologies for analysis of knowledge in order to make decisions more effectively	,953	,998
Quality of products or services or programs	,907	,946
Developments of new products or services or programs	,922	,949
Ability to attract essential employees	,941	,993
Ability to retain essential employees	,842	,917
Satisfaction of customers or clients	,899	,996
Change of organization’s revenue for the last 3 years	,941	,999
Change in sales of goods or services for the last 3 years	,937	,997
Change of organization’s market share for the last 3 years	,945	,995

Extraction Method: Generalized Least Squares.

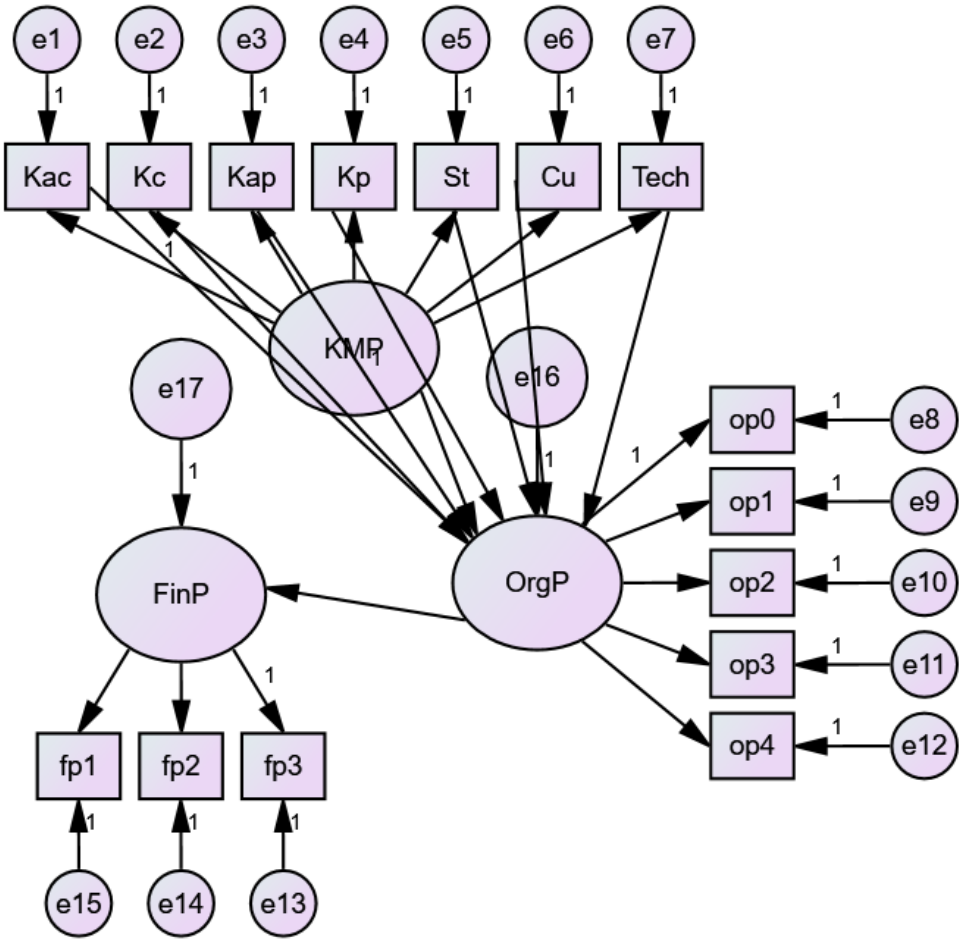
a. One or more communalitiy estimates greater than 1 were encountered during iterations. The resulting solution should be interpreted with caution.

2.4 Correlation matrix

		Knowledge acquisition capabilities	Knowledge conversion capabilities	Knowledge protection capabilities	Knowledge protection capabilities	Organizational Structure capabilities	Organizational Culture capabilities	Technology capabilities	Knowledge Management Indicator	Perceived organizational performance	Financial Performance
Knowledge acquisition capabilities	Pearson Correlation	1	,759**	,685**	,425**	,335*	,746**	,788**	,868**	,700**	,489**
	Sig. (2-tailed)		,000	,000	,006	,032	,000	,000	,000	,000	,001
	N	41	41	41	41	41	41	41	41	41	41
Knowledge conversion capabilities	Pearson Correlation	,759**	1	,773**	,417**	,247	,756**	,692**	,839**	,585**	,434**
	Sig. (2-tailed)	,000		,000	,007	,119	,000	,000	,000	,000	,005
	N	41	41	41	41	41	41	41	41	41	41
Knowledge protection capabilities	Pearson Correlation	,685**	,773**	1	,542**	,296	,760**	,638**	,849**	,606**	,421**
	Sig. (2-tailed)	,000	,000		,000	,061	,000	,000	,000	,000	,006
	N	41	41	41	41	41	41	41	41	41	41
Knowledge application capabilities	Pearson Correlation	,425**	,417**	,542**	1	-,076	,351*	,514**	,621**	,517**	,285
	Sig. (2-tailed)	,006	,007	,000		,637	,024	,001	,000	,001	,071
	N	41	41	41	41	41	41	41	41	41	41
Organizational Structure capabilities	Pearson Correlation	,335*	,247	,296	-,076	1	,463**	,409**	,488**	,208	,239
	Sig. (2-tailed)	,032	,119	,061	,637		,002	,008	,001	,191	,133
	N	41	41	41	41	41	41	41	41	41	41
Organizational Culture capabilities	Pearson Correlation	,746**	,756**	,760**	,351*	,463**	1	,637**	,856**	,532**	,447**
	Sig. (2-tailed)	,000	,000	,000	,024	,002		,000	,000	,000	,003
	N	41	41	41	41	41	41	41	41	41	41
Technology capabilities	Pearson Correlation	,788**	,692**	,638**	,514**	,409**	,637**	1	,883**	,651**	,501**
	Sig. (2-tailed)	,000	,000	,000	,001	,008	,000		,000	,000	,001
	N	41	41	41	41	41	41	41	41	41	41
Knowledge Management Indicator	Pearson Correlation	,868**	,839**	,849**	,621**	,488**	,856**	,883**	1	,706**	,522**
	Sig. (2-tailed)	,000	,000	,000	,000	,001	,000	,000		,000	,000
	N	41	41	41	41	41	41	41	41	41	41
Perceived organizational performance	Pearson Correlation	,700**	,585**	,606**	,517**	,208	,532**	,651**	,706**	1	,597**
	Sig. (2-tailed)	,000	,000	,000	,001	,191	,000	,000	,000		,000
	N	41	41	41	41	41	41	41	41	41	41
Financial Performance	Pearson Correlation	,489**	,434**	,421**	,285	,239	,447**	,501**	,522**	,597**	1
	Sig. (2-tailed)	,001	,005	,006	,071	,133	,003	,001	,000	,000	
	N	41	41	41	41	41	41	41	41	41	41

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

2.5 Structural Equation Modelling



Result (Default model)

Minimum was achieved
Chi-square = 169,185
Degrees of freedom = 82
Probability level = ,000

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
Kac	<---	KMP	1,000				
Kc	<---	KMP	,977	,129	7,547	***	
Kap	<---	KMP	,836	,118	7,088	***	
Kp	<---	KMP	,866	,251	3,452	***	
St	<---	KMP	,295	,121	2,440	,015	
Cu	<---	KMP	,876	,121	7,220	***	
Tech	<---	KMP	1,055	,162	6,514	***	

			Estimate	S.E.	C.R.	P	Label
OrgP	<---	KMP	,729	,160	2,869	,000	
OrgP	<---	Tech	,623	,294	2,116	,034	
OrgP	<---	Cu	,351	,176	1,989	,047	
OrgP	<---	St	,825	,511	1,613	,107	
OrgP	<---	Kp	,224	,097	2,316	,021	
OrgP	<---	Kap	1,000				
OrgP	<---	Kc	1,189	,558	2,130	,033	
OrgP	<---	Kac	1,315	,513	2,564	,010	
FinP	<---	OrgP	,863	,222	3,877	***	
op0	<---	OrgP	1,000				
op1	<---	OrgP	1,109	,247	4,493	***	
op2	<---	OrgP	1,044	,241	4,327	***	
op3	<---	OrgP	,876	,221	3,967	***	
op4	<---	OrgP	,749	,165	4,526	***	
fp3	<---	FinP	1,000				
fp2	<---	FinP	1,105	,154	7,169	***	
fp1	<---	FinP	1,059	,135	7,860	***	

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
KMP	,772	,226	3,421	***	
e1	,247	,071	3,457	***	
e2	,222	,065	3,394	***	
e3	,212	,058	3,647	***	
e4	1,615	,371	4,358	***	
e5	,397	,090	4,419	***	
e6	,216	,060	3,583	***	
e7	,457	,118	3,866	***	
e16	-,878	,763	-1,150	,250	
e17	,597	,194	3,074	,002	
e8	,390	,111	3,511	***	
e9	,839	,214	3,928	***	
e10	,841	,211	3,992	***	
e11	,770	,188	4,104	***	
e12	,373	,095	3,915	***	
e13	,303	,103	2,939	,003	
e14	,489	,146	3,344	***	
e15	,260	,104	2,510	,012	